Part 1 Definitions

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1.1 Definitions

(1) In this Occupational Health and Safety Regulation

"acceptable to the Board"
Note: Many sections of the Occupational Health and Safety Regulation refer to standards, procedures, or means "acceptable to the Board." Information on what is acceptable to the Board may be obtained by referring to the OHS Guidelines on the particular section at www.worksafebc.com or other Board publications, or by contacting the Board.

"administrative controls" means the provision, use and scheduling of work activities and resources in the workplace, including planning, organizing, staffing and coordinating, for the purpose of controlling risk;

"Board" means the Workers' Compensation Board;

"combustible liquid" means a substance which meets the criteria for WHMIS Class B Division 3 combustible liquid (a flash point of 37.8°C (100°F) or more but less than 93.3°C (200°F);

"contaminant" means a harmful or irritant material, or nuisance dust, foreign to the normal composition of a substance, or a material that varies the normal proportions of components in a mixture such as air;

"engineering controls" means the physical arrangement, design or alteration of workstations, equipment, materials, production facilities or other aspects of the physical work environment, for the purpose of controlling risk;

"flammable liquid" means a substance which meets the criterion for WHMIS Class B Division 2 flammable liquid (a flash point less than 37.8°C (100°F);

"hazard" means a thing or condition that may expose a person to a risk of injury or occupational disease;

"hazard area" means an area in a workplace where a hazard exists, or is created, due to a condition in the area or the activities conducted in it;

"hazardous product" means any product, mixture, material or substance that is classified in accordance with the regulations made under section 15 (1) of the *Hazardous Products Act* (Canada) in a category or subcategory of a hazard class listed in Schedule 2 of that Act;

"HEPA" means, in reference to air filtration, a high efficiency particulate air filter meeting the specifications of a nuclear grade filter, providing a 99.97% filtration efficiency at a 0.3 micrometre particle size;

"incident" includes an accident or other occurrence which resulted in or had the potential for causing an injury or occupational disease;

"IDLH atmosphere" means an atmosphere containing a substance at a concentration which is immediately dangerous to life or health (IDLH) because the concentration is greater than that from which one could escape without any escape-impairing symptoms or irreversible health effects, and includes an atmosphere with an unknown concentration with the potential to be immediately dangerous to life or health;

"mg/m^3" means milligrams of a substance per cubic metre of air;
Note: It is a measure of weight and generally applies to aerosols such as dusts, fumes and mists.

"oxygen deficient" means, in relation to air, a condition in which there is less than 19.5% oxygen by volume, or the partial pressure of oxygen is less than 16.3 kPa (122 mm Hg);

"ppm" means parts of a vapour or a gas per million parts of contaminated air by volume at a temperature of 25 degrees Celsius and an atmospheric pressure of 760 millimetres of mercury;

"practicable" means that which is reasonably capable of being done;

"professional engineer" means a person who is registered or licensed to practice engineering under the provisions of the *Engineers and Geoscientists Act;*

"professional geoscientist" means a professional geoscientist or licensee under the *Engineers and Geoscientists Act*;

"qualified" means being knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination thereof;

"qualified registered professional" means

(a) a professional engineer or professional geoscientist, and

(b) in relation to a forestry operation, a person referred to in paragraph (a) or a registered professional forester, registered forest technologist or holder of a special permit under the *Foresters Act*;

"rated capacity" or *"rated load"* means the load that machinery or a piece of equipment is, in accordance with its design, rated to bear under section 4.8;

"resource road" means a road or portion of a road on Crown land, and includes a bridge, culvert, ford or other structure or work associated with the road, but does not include a highway within the meaning of

the *Transportation Act*,

"risk" means a chance of injury or occupational disease;

"safety data sheet" or *"SDS"* means a document that contains, under the headings that, by virtue of the regulations made under section 15 (1) of the *Hazardous Products Act* (Canada), are required to appear in the document, information about a hazardous product, including information related to the hazards associated with any use, handling or storage of the hazardous product in the workplace;

"sensitizer" means a substance that has been shown to elicit an allergenic type of response in humans after an initial exposure, resulting in development of symptoms upon subsequent exposure at much lower concentrations;

"supervisor" means a person who instructs, directs and controls workers in the performance of their duties;

"utility service" means a petroleum pipeline, sanitary sewer line, enclosed storm sewer, water line, steam line or electrical cable;

"WHMIS" means the Workplace Hazardous Materials Information System referred to in section 5.3;

"working load limit" or *"WLL"* means the maximum load which a product is authorized by the manufacturer to support in a particular service.

(2) Subject to subsection (3), in this Regulation, *"workplace"* does not include a resource road.

(3) A portion of a resource road is a workplace during any period within which the portion is being built, maintained, repaired, rehabilitated, stabilized, upgraded, removed or deactivated.

(4) Although a resource road does not constitute a workplace for the purposes of this Regulation, other than in one of the limited circumstances referred to in subsection (3), a reference to a workplace in this Regulation continues to include a thing or place that constitutes a workplace even though that thing, or an activity or the result of an activity initiated or carried out at that place, is in whole or in part on a resource road.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

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

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

[Amended by B.C. Reg. 305/2012, effective October 16, 2012.]

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

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Part 2 Application

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2.1 Scope of application

This Occupational Health and Safety Regulation applies to all employers, workers and all other persons working in or contributing to the production of any industry within the scope of Part 3 of the *Workers Compensation Act.*

2.2 General duty

Despite the absence of a specific requirement, all work must be carried out without undue risk of injury or occupational disease to any person.

2.3 Conflict with a code or standard

If there is any conflict between the requirements of this Regulation and any code or standard with which compliance is required by this Regulation, the provisions of this Regulation prevail.

2.4 Prompt compliance

Every person to whom an order or directive is issued by the Board must comply promptly or by the time set out in the order or directive.

2.5 Inspection reports

(1) An inspection report must remain posted for at least 7 days, or until compliance has been achieved, whichever is the longer period.

(2) When a joint committee or a worker health and safety representative is required at a workplace, the employer must produce for the committee or representative the inspection report, or a copy of it, at or before the next meeting of the committee or with the representative.

Note: Subsection (1) provides minimum posting requirements for inspection reports. Part 3, Division 4, section 138 of the *Workers Compensation Act* requires that if an inspection report contains orders related to joint committees or worker health and safety representatives as covered by the Act, then the orders must remain posted for 12 months.

2.6 Notification of compliance

When an employer is required to provide notification of compliance in response to an inspection report the employer must ensure that a copy of the notification is posted next to the originating inspection report until compliance has been achieved.

2.7 Notice to workers

Every employer must post in a conspicuous place at each workplace any placard issued by the Board titled "Notice to Workers".

2.8 Contravention

(1) A contravention of this Regulation will be deemed to be a contravention by the employer and will make that employer liable for any penalty prescribed by the *Workers Compensation Act*.

(2) A contravention of this Regulation by a supervisor or a worker will be deemed to be a contravention by the supervisor and will make that supervisor liable for any penalty prescribed by the *Workers Compensation Act*.

(3) A contravention of this Regulation by a worker will make that worker liable for any penalty prescribed by the *Workers Compensation Act*.

(4) A contravention of this Regulation by a person working in or contributing to the production of an industry within the scope of the *Workers Compensation Act* will make that person liable for any penalty prescribed by the *Act*.

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Occupational Health and Safety Programs

Note: The general duties of employers, workers, supervisors, owners, suppliers, and directors and officers of a corporation are established in the *Workers Compensation Act* Part 3, Division 3, sections 115 through 124.

The requirements for a joint health and safety committee or a worker health and safety representative, committee membership and selection, duties and functions, procedures, and entitlement to time from work and educational leave are established in the *Workers Compensation Act* Part 3, Division 4, sections 125 through 140.

3.1 When program required

(1) An occupational health and safety program as outlined in section 3.3 must be initiated and maintained

(a) by each employer that has

(i) a workforce of 20 or more workers, and

(ii) at least one workplace that is determined under section 3.16 (2) (b) to create a moderate or high risk of injury, or

(b) by each employer that has a workforce of 50 or more workers.

(1.1) If subsection (1) (a) or (b) applies to the employer, the occupational health and safety program applies to the whole of the employer's operations.

(2) Despite subsection (1) an occupational health and safety program may be required in any workplace when, in the opinion of an officer, such a program is necessary.

[Amended by B.C. Reg. 348/2003, effective March 30, 2004.]

[Amended by B.C. Reg. 19/2006, effective May 17, 2006.]

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

3.2 Small operations

In any operation where the workforce is less than that referred to in section 3.1(1) the employer must

(a) initiate and maintain a less formal program based on regular monthly meetings with workers for discussion of health and safety matters,

(b) ensure that meetings are directed to matters concerning the correction of unsafe conditions and practices and the maintenance of cooperative interest in the health and safety of the workforce, and

(c) maintain a record of the meetings and the matters discussed.

3.3 Contents of program

The occupational health and safety program must be designed to prevent injuries and occupational diseases, and without limiting the generality of the foregoing, the program must include

(a) a statement of the employer's aims and the responsibilities of the employer, supervisors and workers,

(b) provision for the regular inspection of premises, equipment, work methods and work practices, at appropriate intervals, to ensure that prompt action is undertaken to correct any hazardous conditions found,

(c) appropriate written instructions, available for reference by all workers, to supplement this Occupational Health and Safety Regulation,

(d) provision for holding periodic management meetings for the purpose of reviewing health and safety activities and incident trends, and for the determination of necessary courses of action,

(e) provision for the prompt investigation of incidents to determine the action necessary to prevent their recurrence,

(f) the maintenance of records and statistics, including reports of inspections and incident investigations, with provision for making this information available to the joint committee or worker health and safety representative, as applicable and, upon request, to an officer, the union representing the workers at the workplace or, if there is no union, the workers at the workplace, and

(g) provision by the employer for the instruction and supervision of workers in the safe performance of their work.

3.4 Incident investigation reports

(1) An employer must ensure that an incident investigation report required by Division 10 of Part 3 of the *Workers Compensation Act* contains

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

(b) the names and job titles of persons injured in the incident,

(c) the names of witnesses,

(d) a brief description of the incident,

(e) a statement of the sequence of events which preceded the incident,

(f) identification of any unsafe conditions, acts or procedures which contributed in any manner to the incident,

(g) recommended corrective actions to prevent similar incidents, and

(h) the names of the persons who investigated the incident.

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3.5 General requirement

Every employer must ensure that regular inspections are made of all workplaces, including buildings, structures, grounds, excavations, tools, equipment, machinery and work methods and practices, at intervals that will prevent the development of unsafe working conditions.

3.6 Inspection of tools and equipment

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

* See section 4.3 of the OHS Regulation.

3.7 Special inspections

A special inspection must be made when required by malfunction or accident.

3.8 Participation of the committee or representative

An inspection required by section 3.5 and a major inspection required by section 3.7 must, where feasible, include the participation of members of the joint committee or the worker health and safety representative, as applicable, but

(a) if there is no committee or worker health and safety representative the employer must designate an employer representative and the union must designate a worker representative, or

(b) if there is no union the employer must invite the workers to designate one of their number.

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3.9 Remedy without delay

Unsafe or harmful conditions found in the course of an inspection must be remedied without delay.

3.10 Reporting unsafe conditions

Whenever a person observes what appears to be an unsafe or harmful condition or act the person must report it as soon as possible to a supervisor or to the employer, and the person receiving the report must investigate the reported unsafe condition or act and must ensure that any necessary corrective action is taken without delay.

3.11 Emergency circumstances

If emergency action is required to correct a condition which constitutes an immediate threat to workers only those qualified and properly instructed workers necessary to correct the unsafe condition may be exposed to the hazard, and every possible effort must be made to control the hazard while this is being done.

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3.12 Procedure for refusal

(1) A person must not carry out or cause to be carried out any work process or operate or cause to be operated any tool, appliance or equipment if that person has reasonable cause to believe that to do so would create an undue hazard to the health and safety of any person.

(2) A worker who refuses to carry out a work process or operate a tool, appliance or equipment pursuant to subsection (1) must immediately report the circumstances of the unsafe condition to his or her supervisor or employer.

(3) A supervisor or employer receiving a report made under subsection (2) must immediately investigate the matter and

(a) ensure that any unsafe condition is remedied without delay, or

(b) if in his or her opinion the report is not valid, must so inform the person who made the report.

(4) If the procedure under subsection (3) does not resolve the matter and the worker continues to refuse to carry out the work process or operate the tool, appliance or equipment, the supervisor or employer must investigate the matter in the presence of the worker who made the report and in the presence of

(a) a worker member of the joint committee,

(b) a worker who is selected by a trade union representing the worker, or

(c) if there is no joint committee or the worker is not represented by a trade union, any other reasonably available worker selected by the worker.

(5) If the investigation under subsection (4) does not resolve the matter and the worker continues to

refuse to carry out the work process or operate the tool, appliance or equipment, both the supervisor, or the employer, and the worker must immediately notify an officer, who must investigate the matter without undue delay and issue whatever orders are deemed necessary.

3.13 No discriminatory action

(1) A worker must not be subject to discriminatory action as defined in section 150 of Part 3 of the *Workers Compensation Act* because the worker has acted in compliance with section 3.12 or with an order made by an officer.

(2) Temporary assignment to alternative work at no loss in pay to the worker until the matter in section 3.12 is resolved is deemed not to constitute discriminatory action.

Note: The prohibition against discriminatory action is established in the *Workers Compensation Act* Part 3, Division 6, sections 150 through 153.

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3.14 Definitions

In this section and in sections 3.15 to 3.21,

"first aid" means

(a) in cases in which a person will need medical treatment, treatment for the purpose of preserving life and minimizing the consequences of injury until medical treatment is obtained, and

(b) treatment of minor injuries that would otherwise receive no medical treatment or that do not need medical treatment;

"first aid attendant" means a person who holds a valid first aid certificate issued by the Board or by a person recognized by the Board and who is designated as a first aid attendant by the employer;

"injured worker" means a worker who suffers an injury during work;

"injury" includes an occupational disease or illness;

"medical certificate" means a report in a form acceptable to the Board from a physician registered under the *Medical Practitioners Act* as to a person's fitness to perform the functions of a first aid attendant.

[Enacted by B.C. Reg. 348/2003, effective March 30, 2004.]

3.15 First aid attendant qualifications

The employer must ensure that a person who is designated as a first aid attendant

(a) is at least 16 years old,

(b) has successfully completed the first aid training course or first aid examination developed or approved by the Board,

(c) has a first aid certificate in good standing at the required level issued by the Board or a person recognized by the Board, and

(d) meets any other requirements determined by the Board for designation as a first aid attendant.

[Enacted by B.C. Reg. 348/2003, effective March 30, 2004.]

3.16 Basic requirements

(1) The employer must provide for each workplace such equipment, supplies, facilities, first aid attendants and services as are adequate and appropriate for

(a) promptly rendering first aid to workers if they suffer an injury at work, and

(b) transporting injured workers to medical treatment.

(1.1) The type and quantity of equipment, supplies, facilities, first aid attendants and services referred to in subsection (1) must be no less than is required by Schedule 3-A.

(1.2) The quality, maintenance and use of equipment, facilities and methods of transportation referred to in this section must be acceptable to the Board.

(2) For the purpose of complying with subsection (1), the employer must conduct an assessment of the circumstances of the workplace, including

(a) the number of workers who may require first aid at any time,

(b) the nature and extent of the risks and hazards in the workplace, including whether or not the workplace as a whole creates a low, moderate or high risk of injury,

(c) the types of injuries likely to occur,

(d) any barriers to first aid being provided to an injured worker, and

(e) the time that may be required to obtain transportation and to transport an injured worker to medical treatment.

(3) The employer must review the assessment under subsection (2)

(a) within 12 months after the previous assessment or review, and

(b) whenever a significant change affecting the assessment occurs in the employer's operations.

(4) First aid equipment, supplies and facilities must be kept clean, dry and ready for use, and be readily accessible at any time a worker works in the workplace.

[Enacted by B.C. Reg. 348/2003, effective March 30, 2004.]

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

3.17 First aid procedures

(1) The employer must keep up-to-date written procedures for providing first aid at the worksite including

(a) the equipment, supplies, facilities, first aid attendants and services available,

(b) the location of, and how to call for, first aid,

(c) how the first aid attendant is to respond to a call for first aid,

(d) the authority of the first aid attendant over the treatment of injured workers and the responsibility of the employer to report injuries to the Board,

(e) who is to call for transportation for the injured worker, and the method of transportation and calling, and

(f) prearranged routes in and out of the workplace and to medical treatment.

(2) The employer must post the procedures conspicuously in suitable locations throughout the workplace or, if posting is not practicable, the employer must adopt other measures to ensure that the information is effectively communicated to workers.

(3) The first aid attendant and all other persons authorized to call for transportation for injured workers must be trained in the procedures.

[Enacted by B.C. Reg. 348/2003, effective March 30, 2004.]

3.17.1 Air transportation

If air transportation is the primary or only method for transporting an injured worker, all of the following requirements must be met:

(a) before the start of operations in a workplace, arrangements must be made with an air service to ensure that an appropriate aircraft is reasonably available to the workplace during those operations;

(b) the arrangements in paragraph (a) must include procedures for

(i) the employer to determine the availability of appropriate aircraft before the start of each work day, and

(ii) the air service to notify the employer if an appropriate aircraft ceases to be available;

(c) a system must be provided that enables the pilot of the aircraft and the first aid attendant attending to an injured worker to communicate at all times when the aircraft is in transit to the location of the injured worker and during transport of the injured worker to medical treatment.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

3.18 Communication and availability

(1) The employer must provide an effective means for

(a) communication between the first aid attendant and the workers served, and

(b) the first aid attendant to call for assistance.

(2) The employer must not assign, and the first aid attendant must not undertake, employment activities that will interfere with the attendant's ability to receive and respond to a request for first aid.

[Enacted by B.C. Reg. 348/2003, effective March 30, 2004.]

3.19 First aid records

(1) The employer must maintain at the workplace, in a form acceptable to the Board, a record of all injuries and exposures to contaminants covered by this Regulation that are reported or treated.

(2) First aid records must be kept for at least 3 years.

(3) First aid records are to be kept confidential and may not be disclosed except as permitted by this Regulation or otherwise permitted by law.

(4) First aid records must be available for inspection by an officer of the Board.

(5) Workers may request or authorize access to their first aid records for any treatment or report about themselves.

[Enacted by B.C. Reg. 348/2003, effective March 30, 2004.]

3.20 Multiple employer workplaces

If workers of 2 or more employers are working at a workplace at the same time, the prime contractor must

(a) conduct an assessment of the circumstances of the workplace under section 3.16 (2) in relation to all the workers in the workplace, and

(b) do everything that is reasonably practicable to establish and maintain the first aid equipment, supplies, facilities, first aid attendants and services required under section 3.16.

[Enacted by B.C. Reg. 348/2003, effective March 30, 2004.]

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

3.21 First aid attendant responsibilities

(1) The first aid attendant must

(a) promptly provide injured workers with a level of care within the scope of the attendant's training and this Part,

(b) objectively record observed or reported signs and symptoms of injuries and exposures to contaminants covered by this Regulation, and

(c) refer for medical treatment workers with injuries considered by the first aid attendant as being serious or beyond the scope of the attendant's training.

(2) A first aid attendant must be physically and mentally capable of safely and effectively performing the required duties, and the Board may at any time require the attendant to provide a medical certificate.

(3) The first aid attendant is responsible, and has full authority, for all first aid treatment of an injured worker until responsibility for treatment is accepted

(a) at a place of medical treatment,

(b) by an ambulance service acceptable to the Board, or

(c) by a person with higher or equivalent first aid certification.

(4) The first aid attendant does not have authority to overrule a worker's decision to seek medical treatment or the worker's choice of medical treatment.

[Enacted by B.C. Reg. 348/2003, effective March 30, 2004.]

Schedule 3-A Minimum Levels of First Aid

1 In this Schedule:

"ambulance service" means an ambulance service acceptable to the Board;

"hospital" means a hospital within the meaning of the *Hospital Act* or a diagnostic and treatment centre where the hospital or centre has

(a) an emergency department or resuscitation area, and

(b) a physician on duty or immediately available on call.

2 (1) Tables 1 to 6 have different levels of first aid service that are based on how long it takes to transport an injured person to a hospital and the number of workers per shift.

(2) Exceptions to note: In circumstances in which Tables 1 to 6 would otherwise require a Level 2 first aid certificate under column 3 *[noted with an asterisk (*)]*, a Level 3 first aid certificate is required and an Emergency Transportation Vehicle ("ETV") must be provided, if

(a) there is on the access route to the workplace an obstruction, barrier, rough terrain or other similar circumstances likely to delay the arrival of an ambulance service for more than 20 minutes after it was dispatched, or

(b) there are areas in the workplace which an ambulance service cannot safely access, and for which workers at the workplace are required by this Regulation to be trained, equipped and capable of effecting

rescue.

Table 1: This table applies to a workplace that an employer determines under section 3.16 (2) (b) of the Regulation creates a low risk of injury and that is more than 20 minutes surface travel time away from a hospital.

Item	Column 1 Number of workers per shift	Column 2 Supplies, equipment, and facility	Column 3 Level of first aid certificate for attendant	Column 4 Transportation
1	1	• Personal first aid kit		
2	2-5	• Basic first aid kit		
3	6-30	• Level 1 first aid kit	Level 1 certificate	
4	31-50	• Level 1 first aid kit • ETV equipment	Level 1 certificate with Transportation Endorsement	
5	51-75	• Level 3 first aid kit • Dressing station • ETV equipment	Level 3 certificate	
6	76 or more	• Level 3 first aid kit • First aid room • ETV equipment	Level 3 certificate	ETV

Table 2: This table applies to a workplace that an employer determines under section 3.16 (2) (b) of the Regulation creates a low risk of injury and that is 20 minutes or less surface travel time away from a hospital.

Item	Column 1 Number of workers per shift	Column 2 Supplies, equipment, and facility	Column 3 Level of first aid certificate for attendant	Column 4 Transportation
1	1			
2	2-10	• Basic first aid kit		
3	11-50	• Level 1 first aid kit	Level 1 certificate	
4	51-100	• Level 2 first aid kit • Dressing station	*Level 2 certificate	
5	101 or more	• Level 2 first aid kit • First aid room	*Level 2 certificate	

Table 3: This table applies to a workplace that an employer determines under section 3.16 (2) (b) of the Regulation creates a moderate risk of injury and that is more than 20 minutes surface travel time away from a hospital.

Item	Column 1 Number of workers per shift	Column 2 Supplies, equipment, and facility	Column 3 Level of first aid certificate for attendant	Column 4 Transportation
1	1	• Personal first aid kit		
2	2-5	• Level 1 first aid kit	Level 1 certificate	

3	6-15	• Level 1 first aid kit • ETV equipment	Level 1 certificate with Transportation Endorsement	
4	16-50	• Level 3 first aid kit • Dressing station • ETV equipment	Level 3 certificate	ETV
5	51-100	• Level 3 first aid kit • First aid room • ETV equipment	Level 3 certificate	ETV
6	101-300	• Level 3 first aid kit • First aid room • Industrial ambulance equipment	Level 3 certificate	Industrial ambulance
7	301 or more	• Level 3 first aid kit • First aid room • Industrial ambulance equipment	2 attendants, each with Level 3 certificates	Industrial ambulance

Table 4: This table applies to a workplace that an employer determines under section 3.16 (2) (b) of the Regulation creates a moderate risk of injury and that is 20 minutes or less surface travel time away from a hospital.

Item	Column 1 Number of workers per shift	Column 2 Supplies, equipment, and facility	Column 3 Level of first aid certificate for attendant	Column 4 Transportation

1	1	• Personal first aid kit		
2	2-5	• Basic first aid kit		
3	6-25	• Level 1 first aid kit	Level 1 certificate	
4	26-75	• Level 2 first aid kit • Dressing station	* Level 2 certificate	
5	76 or more	• Level 2 first aid kit • First aid room	* Level 2 certificate	

Table 5: This table applies to a workplace that an employer determines under section 3.16 (2) (b) of the Regulation creates a high risk of injury and that is more than 20 minutes surface travel time away from a hospital.

Item	**Column 1 Number of workers per shift**	**Column 2 Supplies, equipment, and facility**	**Column 3 Level of first aid certificate for attendant**	**Column 4 Transportation**
1	1	• Personal first aid kit		
2	2-5	• Level 1 first aid kit	Level 1 certificate	
3	6-10	• Level 1 first aid kit • ETV equipment	Level 1 certificate with Transportation Endorsement	ETV

4	11-30	• Level 3 first aid kit • Dressing station • ETV equipment	Level 3 certificate	ETV
5	31-50	• Level 3 first aid kit • First aid room • ETV equipment	Level 3 certificate	ETV
6	51-200	• Level 3 first aid kit • First aid room • Industrial ambulance equipment	Level 3 certificate	Industrial ambulance
7	201 or more	• Level 3 first aid kit • First aid room • Industrial ambulance equipment	2 attendants, each with Level 3 certificates	Industrial ambulance

Table 6: This table applies to a workplace that an employer determines under section 3.16 (2) (b) of the Regulation creates a high risk of injury and that is 20 minutes or less surface travel time away from a hospital.

Item	**Column 1 Number of workers per shift**	**Column 2 Supplies, equipment, and facility**	**Column 3 Level of first aid certificate for attendant**	**Column 4 Transportation**
1	1	• Personal first aid kit		

2	2-15	• Level 1 first aid kit	Level 1 certificate	
3	16-30	• Level 2 first aid kit • Dressing station	* Level 2 certificate	
4	31-300	• Level 2 first aid kit • First aid room	* Level 2 certificate	
5	301 or more	• Level 2 first aid kit • First aid room	* 2 attendants, each with Level 2 certificates	

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

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3.22 Definitions

In sections 3.23 to 3.25:

"new worker" means any worker who is

(a) new to the workplace,

(b) returning to a workplace where the hazards in that workplace have changed during the worker's absence,

(c) affected by a change in the hazards of a workplace, or

(d) relocated to a new workplace if the hazards in that workplace are different from the hazards in the worker's previous workplace;

"young worker" means any worker who is under 25 years of age.

[Enacted by B.C. Reg. 105/2007, effective July 26, 2007.]

3.23 Young or new worker orientation and training

(1) An employer must ensure that before a young or new worker begins work in a workplace, the young or new worker is given health and safety orientation and training specific to that young or new worker's workplace.

(2) The following topics must be included in the young or new worker's orientation and training:

(a) the name and contact information for the young or new worker's supervisor;

(b) the employer's and young or new worker's rights and responsibilities under the *Workers Compensation Act* and this Regulation including the reporting of unsafe conditions and the right to refuse to perform unsafe work;

(c) workplace health and safety rules;

(d) hazards to which the young or new worker may be exposed, including risks from robbery, assault or confrontation;

(e) working alone or in isolation;

(f) violence in the workplace;

(g) personal protective equipment;

(h) location of first aid facilities and means of summoning first aid and reporting illnesses and injuries;

(i) emergency procedures;

(j) instruction and demonstration of the young or new worker's work task or work process;

(k) the employer's health and safety program, if required under section 3.1 of this Regulation;

(l) WHMIS information requirements set out in Part 5, as applicable to the young or new worker's workplace;

(m) contact information for the occupational health and safety committee or the worker health and safety representative, as applicable to the workplace.

[Enacted by B.C. Reg. 105/2007, effective July 26, 2007.]

3.24 Additional orientation and training

An employer must provide a young or new worker with additional orientation and training if

(a) workplace observation reveals that the young or new worker is not able to perform work tasks or work processes safely, or

(b) requested by the young or new worker.

[Enacted by B.C. Reg. 105/2007, effective July 26, 2007.]

3.25 Documentation

An employer must keep records of all orientation and training provided under sections 3.23 and 3.24.

[Enacted by B.C. Reg. 105/2007, effective July 26, 2007.]

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4.1 Safe workplace

A workplace must be planned, constructed, used and maintained to protect from danger any person working at the workplace.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

4.1.1 Avalanche risk assessment and safety plan

(1) In this section and section 4.1.2:

"avalanche" means snow avalanche;

"avalanche risk assessment" means the assessment referred to in subsection (2)(a);

"avalanche safety plan" means the plan referred to in subsection (2)(b);

"avalanche safety program" means the program referred to in subsection (6).

(2) Subject to section 4.1.2, if a person working at a workplace may be exposed to a risk associated with an avalanche, the employer must ensure that no work is carried out at the workplace until

(a) a written avalanche risk assessment is completed, and

(b) if the avalanche risk assessment indicates that a person working at the workplace will be exposed to a risk associated with an avalanche, a written avalanche safety plan is developed and implemented.

(3) The avalanche risk assessment must be conducted by a qualified person.

(4) In conducting the avalanche risk assessment, the qualified person must consider all of the hazards and risks associated with an avalanche, including, without limitation, the following:

(a) the topography and vegetation in the area of the workplace;

(b) the snow conditions in the area of the workplace;

(c) the history of avalanches in the area of the workplace;

(d) the nature and duration of work activities to be carried out at the workplace;

(e) the extent, if any, to which the nature and duration of work activities to be carried out at the workplace may affect the topography, vegetation or snow conditions in the area of the workplace;

(f) the nature of the workplace and the buildings and structures at the workplace.

(5) The avalanche safety plan must be developed by a qualified person and, subject to subsection (6), must include measures to eliminate the risks associated with an avalanche.

(6) If eliminating the risks associated with an avalanche is not practicable, the avalanche safety plan must include measures and procedures to minimize those risks, including an avalanche safety program that provides for

(a) the regular monitoring of weather, snow and avalanche conditions in the area of the workplace, at intervals the qualified person considers will be effective,

(b) the implementation of closures or other measures, as specified in the avalanche safety program, and

(c) safe work procedures to be followed by persons working at the workplace.

(7) The employer must make a copy of the avalanche safety program readily available to each person who administers or implements the avalanche safety program for the workplace.

(8) Whenever there is a significant change in the hazards or risks associated with an avalanche in the area of the workplace, the employer must do the following, unless the change is already addressed by the avalanche safety plan:

(a) ensure that a qualified person reviews the avalanche risk assessment and the avalanche safety plan;

(b) make changes to the avalanche risk assessment and the avalanche safety plan, as considered necessary by the qualified person, to reflect the current hazards and risks associated with an avalanche in the area of the workplace.

(9) If the avalanche safety plan includes procedures applicable to a person's work at the workplace,

(a) the employer must provide information and training to the person respecting the procedures, and

(b) the person must comply with the procedures.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

4.1.2 Avalanche risk assessment and safety plan exception NEW

(1) Section 4.1.1 does not apply to work carried out to evaluate whether a person working at the workplace may be exposed to a risk associated with an avalanche.

(2) Section 4.1.1 does not apply if compliance with that section is not practicable when carrying out the following types of work at a workplace where a person may be exposed to a risk associated with an avalanche:

(a) work that

(i) is carried out intermittently,

(ii) involves moving through the workplace without stopping for a significant length of time in a particular area of the workplace, and

(iii) has minimal potential to trigger an avalanche;

(b) work related to an emergency;

(c) work carried out to complete an avalanche risk assessment;

(d) work carried out to develop an avalanche safety plan.

(3) Before a person carries out work to which subsection (2) applies, the employer must ensure that

(a) written safe work procedures are in place to minimize the risks associated with an avalanche, and

(b) the person

(i) understands the risks associated with an avalanche, and

(ii) is trained in the procedures referred to in paragraph (a) of this subsection.

(4) The safe work procedures required under subsection (3) must be developed by a qualified person and must set out the following:

(a) the qualifications and training a person must have in order to be eligible to carry out work to which subsection (2) applies;

(b) the procedures the person referred to in paragraph (a) of this subsection must follow to identify and address risks associated with an avalanche;

(c) the requirements the person referred to in paragraph (a) of this subsection must comply with when using equipment.

(5) A person carrying out work to which subsection (2) applies must comply with the safe work procedures required under subsection (3).

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

4.2 Safe buildings and structures

The employer must ensure that each building and temporary or permanent structure in a workplace is capable of withstanding any stresses likely to be imposed on it.

4.3 Safe machinery and equipment

(1) The employer must ensure that each tool, machine and piece of equipment in the workplace is

(a) capable of safely performing the functions for which it is used, and

(b) selected, used and operated in accordance with

(i) the manufacturer's instructions, if available,

(ii) safe work practices, and

(iii) the requirements of this Regulation.

(2) Unless otherwise specified by this Regulation, the installation, inspection, testing, repair and maintenance of a tool, machine or piece of equipment must be carried out

(a) in accordance with the manufacturer's instructions and any standard the tool, machine or piece of equipment is required to meet, or

(b) as specified by a professional engineer.

(3) A tool, machine or piece of equipment determined to be unsafe for use must be identified in a manner which will ensure it is not inadvertently returned to service until it is made safe for use.

(4) Unless otherwise specified by this Regulation, any modification of a tool, machine or piece of equipment must be carried out in accordance with

(a) the manufacturer's instructions, if available,

(b) safe work practices, and

(c) the requirements of this Regulation.

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

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

4.4 Conformity to standards

(1) If this Regulation requires that a tool, machine or piece of equipment manufactured before April 15, 1998 must meet a code or standard, the tool, machine or piece of equipment must conform to the edition of the code or standard referred to in this Regulation or the edition of the code or standard published at the time the tool, machine or piece of equipment was manufactured, subject only to the modification or upgrading specified to be necessary in this Regulation or in a directive issued by the Board.

(2) When this Regulation requires a person to comply with

(a) a publication, code or standard of the Board or another agency, the person may, as an alternative, comply with another publication, code or standard acceptable to the Board, or

(b) practices, procedures or rules of the Board or another agency, the person may, as an alternative, comply with another practice, procedure or rule acceptable to the Board.

[Enacted by B.C. Reg 253/2001; Effective: January 28, 2002.]

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

4.5 Manuals and information

If this Regulation requires an operation or maintenance manual for a tool, machine or piece of equipment, the employer must ensure that before the tool, machine or piece of equipment is used in the workplace

(a) the manual has been obtained, and

(b) the supplier has provided sufficient information to identify the standard or standards to which the tool, machine or equipment has been manufactured.

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

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

* See also sections 115(1)(b), 116(1)(b), 117(1)(c), and 120 of the *Workers Compensation Act*.

4.6 Reassembly

If machinery, equipment or a structure is dismantled in whole or in part, and subsequently re-assembled, it must be checked by a qualified person and determined to be safe before operation or use.

4.7 Information on rated capacity

If a machine or piece of equipment has a rated capacity which varies with the reach or configuration of the machine or equipment, or has other operating limitations,

(a) appropriate instructions, load charts and warning notices must be affixed to the machine or equipment so as to be visible to the operator when the operator is at the controls, or

(b) the information, in written form, must be available to the operator.

4.8 Rated capacity

(1) Unless provided elsewhere in this Regulation, the rated capacity or rated load of a machine or piece of equipment is that specified by the manufacturer of the machine or piece of equipment based on its design.

(2) The rated capacity or rated load must be certified by a professional engineer if

(a) the manufacturer's specification or other acceptable warranty cannot be produced,

(b) the equipment or machine has been modified in a manner which will change its rated capacity or rated load,

(c) wear, corrosion, damage or signs of fatigue are found which may reduce the rated capacity or rated

load,

(d) the equipment or machine is used in a manner or for a purpose other than that for which it was originally designed, if the use will change the safe working load, or

(e) in the opinion of the Board, the provision of such certification is deemed necessary.

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

4.9 Inspection and maintenance records

(1) If this Regulation requires a machine or piece of equipment to have an inspection and maintenance record, then an effective written or other permanent recording system or log must be immediately available to the equipment operator and to any other person involved with inspection and maintenance of the equipment.

(2) The recording system must

(a) identify the make, model and serial number of the equipment, and the name and address of the current owner,

(b) contain an entry on each shift, signed by the operator of the machine or equipment, reporting the result of each start of shift inspection and safety check, and any observed defect, operating difficulty or need for maintenance occurring on the shift, and

(c) contain an entry signed by the person responsible for any test, inspection, modification, repair or maintenance performed on the equipment, summarizing the work done, indicating the status of the equipment or machine for further use, and if appropriate, noting where a detailed record of the test, inspection, modification, repair or maintenance can be obtained.

(3) If this Regulation requires a machine or piece of equipment to have inspection and maintenance records, then detailed reports of inspection, maintenance, repairs and modifications must be kept for the duration of the service life of the machine or equipment and must be reasonably available to the workplace and made available, upon request, to the operator and to anyone else involved in the operation, inspection, testing or maintenance of the equipment.

4.10 Authorization

(1) A machine or piece of equipment may only be operated by authorized persons.

(2) A person must not be authorized to operate a machine or piece of equipment until the person has been adequately instructed and trained, and has demonstrated an ability to safely operate it.

4.11 Startup

Before any equipment, machinery or work process is put into operation the persons responsible for doing so must ensure that

(a) safeguards and air contaminant controls required by this Regulation are in place and functioning, and

(b) no person will be exposed to undue risk by putting the equipment, machinery or work process into operation.

4.12 Circumvention of safeguards

A person must not intentionally remove, impair, or render ineffective any safeguard provided for the protection of workers, except as permitted by this Regulation.

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4.13 Risk assessment

(1) The employer must conduct a risk assessment in any workplace in which a need to rescue or evacuate workers may arise.

(2) If the risk assessment required by subsection (1) shows a need for evacuation or rescue, appropriate written procedures must be developed and implemented, and a worker assigned to coordinate their implementation.

(3) Written rescue and evacuation procedures are required for but not limited to

(a) work at high angles,

(b) work in confined spaces or where there is a risk of entrapment,

(c) work with hazardous substances,

(d) underground work,

(e) work on or over water, and

(f) workplaces where there are persons who require physical assistance to be moved.

4.14 Emergency procedures

(1) Emergency means of escape must be provided from any work area in which the malfunctioning of equipment or a work process could create an immediate danger to workers and the regular means of exit could become dangerous or unusable.

(2) Emergency exit routes must be designed and marked to provide quick and unimpeded exit.

(3) At least once each year emergency drills must be held to ensure awareness and effectiveness of emergency exit routes and procedures, and a record of the drills must be kept.

4.15 Maintenance of equipment

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

4.16 Training

(1) All workers must be given adequate instruction in the fire prevention and emergency evacuation procedures applicable to their workplace.

(2) Workers assigned to firefighting duties in their workplace must be given adequate training, by a qualified instructor, in fire suppression methods, fire prevention, emergency procedures, organization and chain of command, firefighting crew safety and communications applicable to their workplace.

(3) Retraining for firefighting duties must be provided periodically, but not less than once a year.

(4) A worker not covered by Part 31 (Firefighting), who is assigned to firefighting duties, must be physically capable of performing the assigned duties safely and effectively before being permitted to do them.

4.17 Notification of fire departments

(1) An employer having at a workplace hazardous products covered by WHMIS, explosives, pesticides, radioactive material, consumer products or hazardous wastes in quantities which may endanger firefighters, must ensure the local fire department is notified of the nature and location of the hazardous materials or substances and methods to be used in their safe handling.

(2) Subsection (1) does not apply to a workplace

(a) where materials are kept on site for less than 15 days if the employer ensures an alternative effective means for notification of fire departments is in place in the event of fire or other emergency, or

(b) which is not within the service area of a fire department.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

4.18 Notification of utility service providers

If work activities conducted by or on behalf of an employer cause a utility service to be hit or damaged, the employer must notify the owner of the utility service without delay.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

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4.19 Physical or mental impairment

(1) A worker with a physical or mental impairment which may affect the worker's ability to safely perform assigned work must inform his or her supervisor or employer of the impairment, and must not knowingly do work where the impairment may create an undue risk to the worker or anyone else.

(2) A worker must not be assigned to activities where a reported or observed impairment may create an undue risk to the worker or anyone else.

4.20 Impairment by alcohol, drug or other substance

(1) A person must not enter or remain at any workplace while the person's ability to work is affected by alcohol, a drug or other substance so as to endanger the person or anyone else.

(2) The employer must not knowingly permit a person to remain at any workplace while the person's ability to work is affected by alcohol, a drug or other substance so as to endanger the person or anyone else.

(3) A person must not remain at a workplace if the person's behaviour is affected by alcohol, a drug or other substance so as to create an undue risk to workers, except where such a workplace has as one of its purposes the treatment or confinement of such persons.

Note: In the application of sections 4.19 and 4.20, workers and employers need to consider the effects of prescription and non-prescription drugs, and fatigue, as potential sources of impairment. There is a need for disclosure of potential impairment from any source, and for adequate supervision of work to ensure reported or observed impairment is effectively managed.

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4.20.1 Definition

In sections 4.20.2 to 4.23, *"to work alone or in isolation"* means to work in circumstances where assistance would not be readily available to the worker

(a) in case of an emergency, or

(b) in case the worker is injured or in ill health.

[Enacted by B.C. Reg. 318/2007, effective February 1, 2008.]

4.20.2 Hazard identification, elimination and control

(1) Before a worker is assigned to work alone or in isolation, the employer must identify any hazards to

that worker.

(2) Before a worker starts a work assignment with a hazard identified under subsection (1), the employer must take measures

(a) to eliminate the hazard, and

(b) if it is not practicable to eliminate the hazard, to minimize the risk from the hazard.

(3) For purposes of subsection (2) (b), the employer must minimize the risk from the hazard to the lowest level practicable using engineering controls, administrative controls or a combination of engineering and administrative controls.

[Enacted by B.C. Reg. 318/2007, effective February 1, 2008.]

4.21 Procedures for checking well-being of worker

(1) The employer must develop and implement a written procedure for checking the well-being of a worker assigned to work alone or in isolation.

(2) The procedure for checking a worker's well-being must include the time interval between checks and the procedure to follow in case the worker cannot be contacted, including provisions for emergency rescue.

(3) A person must be designated to establish contact with the worker at predetermined intervals and the results must be recorded by the person.

(4) In addition to checks at regular intervals, a check at the end of the work shift must be done.

(5) The procedure for checking a worker's well-being, including time intervals between the checks, must be developed in consultation with the joint committee or the worker health and safety representative, as applicable.

(6) Time intervals for checking a worker's well-being must be developed in consultation with the worker assigned to work alone or in isolation.

[Amended by B.C. Reg. 318/2007, effective February 1, 2008.]

Note: High risk activities require shorter time intervals between checks. The preferred method for checking is visual or two-way voice contact, but where such a system is not practicable, a one-way system which allows the worker to call or signal for help and which will send a call for help if the worker does not reset the device after a predetermined interval is acceptable.

4.22 Training

A worker described in section 4.21(1) and any person assigned to check on the worker must be trained in the written procedure for checking the worker's well-being.

[Amended by B.C. Reg. 318/2007, effective February 1, 2008.]

4.22.1 Late night retail safety procedures and requirements

(1) In this section:

"late night hours" means any time between 11:00 p.m. and 6:00 a.m.;

"late night retail premises" means

(a) a gas station or other retail fueling outlet, or

(b) a convenience store or any other retail store where goods are sold directly to consumers

that is open to the public for late night hours;

"violence prevention program" means a program implemented under subsection (2)(b)(iii).

(2) If a worker is assigned to work alone or in isolation in late night retail premises and there is any risk of harm from a violent act to the worker, then, in addition to any other obligations the employer has under sections 4.20.2 to 4.23 and 4.28 to 4.30,

(a) the employer must develop and implement a written procedure to ensure the worker's safety in handling money, and

(b) when that worker is assigned to work late night hours, the employer must also do one or more of the following:

(i) ensure that the worker is physically separated from the public by a locked door or barrier that prevents physical contact with or access to the worker;

(ii) assign one or more workers to work with the worker during that worker's assignment;

(iii) implement a violence prevention program in accordance with subsections (2.1) to (2.3).

(2.1) A violence prevention program must include procedures, policies and work environment arrangements necessary to ensure that all of the following requirements are met:

(a) there is a time lock safe on the premises that cannot be opened during late night hours;

(b) cash and lottery tickets that are not reasonably required in order to operate during late night hours are stored in the time lock safe referred to in paragraph (a);

(c) there is good visibility both into and out of the premises;

(d) there is limited access to the inside of the premises;

(e) the premises is monitored by video surveillance;

(f) there are signs on the premises, visible to the public, indicating that

(i) the safe on the premises is a time lock safe that cannot be opened during late night hours,

(ii) there is a limited amount of accessible cash and lottery tickets on the premises, and

(iii) the premises is monitored by video surveillance;

(g) a worker described in subsection (2)

(i) is at least 19 years of age, and

(ii) is provided with a personal emergency transmitter that is monitored by

(A) the employer, or

(B) a security company or other person designated by the employer.

(2.2) By the end of the first year of the implementation of a violence prevention program and by the end of every second year after that first year, the employer must receive a security audit report, in writing, from an independent qualified person confirming that the program meets all of the requirements under subsection (2.1).

(2.3) The written security audit report referred to in subsection (2.2) must be

(a) retained by the employer, and

(b) posted by the employer in the workplace

for a period beginning on or immediately after the date the report is received and ending no earlier than the date on which the next report is posted.

(3) The employer must train a worker described in subsection (2) in

(a) the written procedure referred to in subsection (2)(a), and

(b) if the employer implements a violence prevention program, the procedures, policies and work environment arrangements referred to in subsection (2.1).

(4) A worker described in subsection (2) must

(a) follow the written procedure referred to in subsection (2)(a), and

(b) if the employer implements a violence prevention program,

(i) follow the procedures, policies and work environment arrangements referred to in subsection (2.1), and

(ii) wear, during late night hours, the personal emergency transmitter referred to in subsection (2.1)(g)(ii).

[Enacted by B.C. Reg. 318/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

[Amended by B.C. Reg. 230/2011, effective April 15, 2012.]

4.22.2 Mandatory prepayment for fuel

An employer must require that customers prepay for fuel sold in gas stations and other retail fueling

outlets.

[Enacted by B.C. Reg. 318/2007, effective February 1, 2008.]

4.23 Annual reviews of procedures

The procedures referred to in sections 4.21 and 4.22.1(2)(a) and, if a violence prevention program is implemented, the procedures, policies and work environment arrangements referred to in section 4.22.1(2.1), must be reviewed at least annually, or more frequently if there is

(a) a change in work environment arrangements that could adversely affect

(i) the effectiveness of the violence prevention program, or

(ii) a worker's well-being or safety, or

(b) a report that the procedures, policies or work environment arrangements, as applicable, are not working effectively.

[Enacted by B.C. Reg. 318/2007, effective February 1, 2008.]

[Enacted by B.C. Reg. 230/2011, effective April 15, 2012.]

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4.24 Definition

In sections 4.25 and 4.26,

"improper activity or behaviour" includes

(a) the attempted or actual exercise by a worker towards another worker of any physical force so as to cause injury, and includes any threatening statement or behaviour which gives the worker reasonable cause to believe he or she is at risk of injury, and

(b) horseplay, practical jokes, unnecessary running or jumping or similar conduct.

Note: Worker means a worker as defined under the *Workers Compensation Act,* and includes a supervisor or other representative of the employer (see Part 3, Division 1, section 106).

4.25 Prohibition

A person must not engage in any improper activity or behaviour at a workplace that might create or

constitute a hazard to themselves or to any other person.

4.26 Investigation

Improper activity or behaviour must be reported and investigated as required by Part 3 (Rights and Responsibilities).

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4.27 Definition

In sections 4.28 to 4.31,

"violence" means the attempted or actual exercise by a person, other than a worker, of any physical force so as to cause injury to a worker, and includes any threatening statement or behaviour which gives a worker reasonable cause to believe that he or she is at risk of injury.

4.28 Risk assessment

(1) A risk assessment must be performed in any workplace in which a risk of injury to workers from violence arising out of their employment may be present.

(2) The risk assessment must include the consideration of

(a) previous experience in that workplace,

(b) occupational experience in similar workplaces, and

(c) the location and circumstances in which work will take place.

4.29 Procedures and policies

If a risk of injury to workers from violence is identified by an assessment performed under section 4.28 the employer must

(a) establish procedures, policies and work environment arrangements to eliminate the risk to workers from violence, and

(b) if elimination of the risk to workers is not possible, establish procedures, policies and work environment arrangements to minimize the risk to workers.

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

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

* See Part 3 (Occupational Health and Safety) of the *Workers Compensation Act* and Part 3 (Rights and Responsibilities) of the OHS Regulation.

4.30 Instruction of workers

(1) An employer must inform workers who may be exposed to the risk of violence of the nature and extent of the risk.

(2) The duty to inform workers in subsection (1) includes a duty to provide information related to the risk of violence from persons who have a history of violent behaviour and whom workers are likely to encounter in the course of their work.

(3) The employer must instruct workers who may be exposed to the risk of violence in

(a) the means for recognition of the potential for violence,

(b) the procedures, policies and work environment arrangements which have been developed to minimize or effectively control the risk to workers from violence,

(c) the appropriate response to incidents of violence, including how to obtain assistance, and

(d) procedures for reporting, investigating and documenting incidents of violence.

4.31 Advice to consult physician

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

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

(3) The employer must ensure that a worker reporting an injury or adverse symptom as a result of an incident of violence is advised to consult a physician of the worker's choice for treatment or referral.

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

* See Part 3 (Rights and Responsibilities) of the OHS Regulation.

Note: The requirements for risk assessment, procedures and policies, the duty to respond to incidents and to instruct workers are based on the recognition of violence in the workplace as an occupational hazard. This hazard is to be addressed by the occupational health and safety program following the same procedures required by this Occupational Health & Safety Regulation to address other workplace hazards.

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4.32 Access to work areas

There must be a safe way of entering and leaving each place where work is performed and a worker must not use another way, if the other way is hazardous.

4.33 Arrangement of work areas

(1) A work area must be arranged to allow the safe movement of people, equipment and materials.

(2) If, to ensure safety, an aisle or passageway is designated for pedestrian traffic, the route must be clearly indicated by markings or other effective means and, where practicable, floor or grade markings must be used.

4.34 Restricted entry

Hazardous areas not intended to be accessible to workers must be secured by locked doors or equivalent means of security, and must not be entered unless safe work procedures are developed and followed.

4.35 Door installations

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

(2) If a door installed in a workplace swings towards a stair, the full arc of its swing must be over a landing.

(3) A double-acting swing door must permit a person approaching the door to see any person approaching from the opposite side so as not to endanger their safety.

(4) A glass or transparent door must have hardware, bars or markings so that its presence and position are readily apparent.

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

* See also section 4.4 of the of the OHS Regulation.

4.36 Glass

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

* See section 4.4 of the of the OHS Regulation.

(2) A panel, window or sidelight made of glass or similar transparent material, which could be mistaken for a doorway, must have bars or markings so that its presence and position are readily apparent.

4.37 Restricted visibility

A worker must not be permitted to enter or work in an area if visibility in the area is restricted by the presence of smoke, steam or other substance in the atmosphere, unless appropriate safe work procedures are followed.

4.38 Extreme temperatures

(1) An open flame or other high temperature or extreme low temperature source or surface, which could cause a burn or other injury, must be positioned or shielded to prevent contact by workers

(2) If an extreme temperature source is necessarily exposed due to the work process, safe work procedures must be established, and workers must be instructed in those procedures and must wear appropriate clothing and personal protective equipment.

4.39 Slipping and tripping hazards

(1) Floors, platforms, ramps, stairs and walkways available for use by workers must be maintained in a state of good repair and kept free of slipping and tripping hazards.

(2) If such areas are taken out of service the employer must take reasonable means for preventing entry or use.

4.40 Wet floors

If a work process results in a liquid accumulating on the floor or grade surface in a work area and the liquid creates a slipping or other hazard, floor drains or other suitable means must be used to control the hazard.

4.41 Waste material

Refuse, spills and waste material must not be allowed to accumulate so as to constitute a hazard.

4.42 Cleaning with compressed air

(1) Compressed air or steam must not be used for blowing dust, chips, or other substances from equipment, materials and structures if any person could be exposed to the jet, or to the material it expels or propels and an injury or health hazard due to fire, explosion or other cause is likely to result.

(2) Subject to subsection (4) compressed air may not be used for blowing harmful or hazardous dusts or other harmful substances from clothing being worn by workers.

(3) If clothing is to be cleaned before leaving the work area, suitable cleaning equipment must be used.

(4) Compressed air may be used in specially designated areas for blowing dusts or other substances from clothing being worn by workers, provided that

(a) the substances have an exposure limit greater than 1.0 mg/m^3, as established by section 5.48,

(b) appropriate respirators and eye protection are worn, and

(c) the compressed air supply pressure is limited to a pressure of 70 kPa gauge (10 psig), or safety nozzles which have the same pressure limiting effect are used.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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4.43 Stacking materials

(1) Material and equipment must be placed, stacked or stored in a stable and secure manner.

(2) Stacked material or containers must be stabilized as necessary by interlocking, strapping or other effective means of restraint to protect the safety of workers.

4.44 Entrapment

A worker must not enter or remain in any place where there is a danger of entrapment or engulfment in loose materials or from other circumstances unless

(a) safe access and a safe work area is provided by catwalks, walkways, barriers or other means, or

(b) measures are taken, where practicable, to control the risk of entrapment or engulfment and, if the risk is not eliminated, the worker uses a lifeline and harness of a type that will keep the worker in a position so as to be able to be rescued and is continuously tended by a standby person who is equipped for and capable of effecting immediate rescue.

Note: See Part 9 (Confined Spaces) for requirements to control the risk of entrapment or engulfment in a confined space.

4.45 Falling materials

An area in which material may be dropped, dumped or spilled must be guarded to prevent inadvertent entry by workers, or protected by adequate covers and guarding.

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Ergonomics (MSI) Requirements

- Policies

The purpose of sections 4.46 to 4.53 is to eliminate or, if that is not practicable, minimize the risk of musculoskeletal injury to workers.

Note: WorkSafeBC provides publications to assist with implementing the Ergonomics (MSI) Requirements. *Preventing Musculoskeletal Injury (MSI): A Guide for Employers and Joint Committees* provides a MSI prevention process to assist with the application of the ergonomics requirements along with procedures to investigate incidents of MSI and a table of common control measures. *Understanding the Risks of Musculoskeletal Injury (MSI)* is intended to help employers with the requirements of section 4.51(1) to educate workers in risk identification, signs and symptoms of MSI, and their potential health effects.

4.46 Definition

In sections 4.47 to 4.53 (the Ergonomics (MSI) Requirements)

"musculoskeletal injury" or *"MSI"* means an injury or disorder of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissue including a sprain, strain and inflammation, that may be caused or aggravated by work.

4.47 Risk identification

The employer must identify factors in the workplace that may expose workers to a risk of musculoskeletal injury (MSI).

4.48 Risk assessment

When factors that may expose workers to a risk of MSI have been identified, the employer must ensure that the risk to workers is assessed.

4.49 Risk factors

The following factors must be considered, where applicable, in the identification and assessment of the risk of MSI:

(a) the physical demands of work activities, including

(i) force required,

(ii) repetition,

(iii) duration,

(iv) work postures, and

(v) local contact stresses;

(b) aspects of the layout and condition of the workplace or workstation, including

(i) working reaches,

(ii) working heights,

(iii) seating, and

(iv) floor surfaces;

(c) the characteristics of objects handled, including

(i) size and shape,

(ii) load condition and weight distribution, and

(iii) container, tool and equipment handles;

(d) the environmental conditions, including cold temperature;

(e) the following characteristics of the organization of work:

(i) work-recovery cycles;

(ii) task variability;

(iii) work rate.

4.50 Risk control

(1) The employer must eliminate or, if that is not practicable, minimize the risk of MSI to workers.

(2) Personal protective equipment may only be used as a substitute for engineering or administrative controls if it is used in circumstances in which those controls are not practicable.

(3) The employer must, without delay, implement interim control measures when the introduction of permanent control measures will be delayed.

4.51 Education and training

(1) The employer must ensure that a worker who may be exposed to a risk of MSI is educated in risk identification related to the work, including the recognition of early signs and symptoms of MSIs and their potential health effects.

(2) The employer must ensure that a worker to be assigned to work which requires specific measures to control the risk of MSI is trained in the use of those measures, including, where applicable, work procedures, mechanical aids and personal protective equipment.

4.52 Evaluation

(1) The employer must monitor the effectiveness of the measures taken to comply with the Ergonomics

(MSI) Requirements and ensure they are reviewed at least annually.

(2) When the monitoring required by subsection (1) identifies deficiencies, they must be corrected without undue delay.

4.53 Consultation

(1) The employer must consult with the joint committee or the worker health and safety representative, as applicable, with respect to the following when they are required by the Ergonomics (MSI) Requirements:

(a) risk identification, assessment and control;

(b) the content and provision of worker education and training;

(c) the evaluation of the compliance measures taken.

(2) The employer must, when performing a risk assessment, consult with

(a) workers with signs or symptoms of MSI, and

(b) a representative sample of the workers who are required to carry out the work being assessed.

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Work Area Guards and Handrails

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4.54 Definitions

In sections 4.54 to 4.63

"guard" means a protective barrier around an opening in a floor or along the open sides of stairs or a ramp, landing, balcony, mezzanine, raised walkway or any other area to prevent a fall to a lower level, or inadvertent entry into a dangerous area;

"guardrail" means a guard consisting of a top rail 102 cm to 112 cm (40 in to 44 in) above the work surface, and a midrail located approximately midway between the underside of the top rail and the top of the toeboard, if one is provided, or the work surface if no toeboard is provided.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

4.55 Guardrail locations

An area accessible to workers must have guards or guardrails installed in any of the following circumstances:

(a) if a raised floor, open-sided floor, mezzanine, gallery, balcony, work platform, ramp, walkway, or runway is 122 cm (4 ft) or more above the adjacent floor or grade level;

(b) on both sides of any walkway over or adjacent to any substance which is a hazard if a worker fell in, or on it, or which is over machinery or work areas;

(c) around the perimeter of any open container or containment area such as an open vat, bin, tank or pit which is 122 cm (4 ft) or more in depth and which has sides that do not extend at least as high as required for a guardrail above the adjacent grade or work surface;

(d) if a stairway ends in direct proximity to dangerous traffic or other hazard to prevent inadvertent entry into the dangerous area.

4.56 Exceptions

Section 4.55 does not apply

(a) to the front edge of a loading dock or to the viewing edge of a performance stage, and to parts of the scenic units which will be visible to the audience during a rehearsal or performance, provided effective measures are taken to ensure that workers are protected from injury, or

(b) during the construction, demolition, renovation or modification of a work area provided that

(i) access is restricted only to the workers involved in the activity, and

(ii) the requirements of Part 11 (Fall Protection) are followed.

4.57 Elevated workers

If a worker is employed on stilts or work platforms, or is otherwise elevated above the floor, and the effective height of guardrails, walls, or barricades is thus reduced to less than the height specified in section 4.54, additional guardrails must be installed or a personal fall protection system must be used in accordance with the relevant requirements contained in Part 11 (Fall Protection).

4.58 Specifications for guards and guardrails

(1) Guards in a building must be appropriate for the use and occupancy of the area.

(2) Guards in areas not part of a building must meet the applicable criteria of subsections (3) to (5), or other standard acceptable to the Board.

(3) Unless otherwise permitted by subsections (4) and (4.1), guardrails must be installed to withstand a load applied horizontally and normal to the span of the rail, of 550 N (125 lbs) applied at any point along the rail, and a vertical, downward load of 1.5 kN per m (100 lbs per ft) along the top rail, but the horizontal and vertical loads need not be considered to act simultaneously.

(4) Guardrails temporarily installed during the construction, demolition, maintenance or renovation of a work area must be able to withstand a load of 550 N (125 lbs.) applied perpendicular to the span in a horizontal or vertically downward direction at any point on the top rail, or be built to the criteria of subsection (5).

(4.1) If part or all of the top rail or a midrail of a guardrail that is temporarily installed during the construction, demolition, maintenance or renovation of a work area is made of fibre rope, wire rope, chain or other non-rigid material, that part of the guardrail must meet the requirements of *WorkSafeBC Standard — Guardrails using rope or other non-rigid material*, as set out in Schedule 4–A to this Part.

(5) Unless designed by a professional engineer, temporary wooden guardrails on floors and platforms must meet the following criteria:

(a) posts must be spaced not more than 2.4 m (8 ft) apart, except a scaffold may have posts spaced not more than 3 m (10 ft) apart;

(b) wooden top rails must be at least 38 mm x 89 mm (2 in x 4 in nominal) lumber for a span of up to 2.4 m between supports, and at least 38 mm x 140 mm (2 in x 6 in nominal) lumber for a span of 2.4 m to 3 m between supports;

(c) wooden midrails must be 19 mm x 140 mm (1 in x 6 in nominal) or 38 mm x 89 mm (2 in x 4 in nominal) lumber;

(d) wooden rails must be secured to the tops or inner sides of their vertical supports;

(e) wooden guardrail posts must be at least 38 mm x 89 mm (2 in x 4 in nominal) lumber, and must be installed with the narrow dimension facing the open edge;

(f) plastic or wire mesh fencing of adequate strength may be used in place of the midrail, but posts and top rails must comply with the requirements of this section and such fencing must be secured in place.

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

4.58.1 Temporary removal of guardrails

(1) If a guardrail must be removed to accommodate work,

(a) only that portion of the guardrail necessary to allow the work to be done may be removed, and

(b) workers exposed to a fall hazard must be protected by another fall protection system when the guardrail is absent.

(2) The guardrail must be replaced

(a) when the unguarded area is left unattended, and

(b) after the work is completed if the circumstances still require guardrails.

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

4.59 Floor and roof openings

(1) A pit or other opening in a floor, walkway, roof or other area accessible to workers, which is a danger to workers, must be securely covered with a cover of adequate size and strength or guarded by fixed or

movable guardrails, which must be identified as such and kept in place except when necessarily removed to work in the opening or pit.

(2) If compliance with subsection (1) is not practicable for a vehicle service pit, the area around the perimeter of the pit must be marked in a high visibility colour extending back at least 1 m (3.3 ft) from the edge of the pit, and the marking coating or material must provide a skid resistant surface.

(3) Subsection (1) does not apply to a trap door in a performance stage or scenic unit that will be visible to the audience during a rehearsal or performance, provided that effective measures are taken to protect performers and other workers from injury.

(4) If a worker must enter an area not normally accessible and that has openings that are a danger, such openings must be guarded or personal fall protection must be used while the worker is in the area.

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

4.60 Toeboards

(1) Floor openings, elevated walkways and platforms must have toeboards if there is a danger from tools, materials, equipment and debris falling off the edge of the work surface, or there is a danger of slipping off the work surface due to the environment or work practices being used.

(2) The top of a toeboard must be at least 10 cm (4 in) above the floor or platform, and the space between the bottom of the toeboard and the floor or platform must not exceed 13 mm (1/2 in).

(3) If material is stacked or stored on a platform or walkway, or near a floor opening, toeboards must be increased in height or solid or mesh panels of appropriate height must be installed to prevent the material from falling.

(4) Subsections (1) and (2) do not apply to a walkway or a platform that is on a performance stage or scenic unit and will be visible to the audience during a rehearsal or performance, provided that effective measures are taken to protect performers and other workers from injury.

4.61 Walkways

Elevated walkways must be at least 50 cm (20 in) wide, and safe access to walkways must be provided by means of stairs, ramps or fixed ladders.

4.62 Handrails on stairways

(1) Stairs with more than 4 risers must have continuous handrails on

(a) any open side of the stairway,

(b) one side of enclosed stairways 112 cm (44 in) or less in width, and

(c) both sides of enclosed stairways over 112 cm (44 in) wide.

(2) The top of a handrail must be 76 cm to 92 cm (30 in to 36 in) above the stair tread, measured vertically from the nose of the tread, and the height must not vary on any flight or succession of flights of

stairs.

(3) A handrail on an open side of a stairway must have a midrail located approximately midway between the top of the handrail and the nose of the stair tread.

(4) A handrail must be able to withstand a load of 1.3 kN (300 lbs) applied vertically or horizontally at any point along the handrail.

4.63 Vehicle travel areas

A curb must be installed, where practicable, whenever there is a danger of a vehicle or other equipment running off the edge of an elevated area.

Note: It is recommended the height of a curb be a minimum of 1/4 the outside tire diameter for the tires of the largest machine regularly using the area. Curbs should be of substantial construction, and while it may be impracticable to contain large machines, a well-constructed curb of the recommended height will provide warning to the operator that the machine is near the edge.

SCHEDULE 4–A

(section 4.58 [specifications for guards and guardrails])

WORKSAFEBC STANDARD — GUARDRAILS USING ROPE OR OTHER NON-RIGID MATERIAL

1 Scope

This standard sets out the minimum requirements for the design and use of a guardrail system temporarily installed in a workplace and made using a rope rail for part or all of the top rail or midrail of the guardrail system.

2 Definitions

In this standard:

"fall protection system" has the same meaning as in section 11.1 of this regulation;

"guardrail" has the same meaning as in section 4.54 of this regulation;

"rope rail" means a rail made of fibre rope, wire rope, chain or other non-rigid material.

3 Performance and material requirements

(1) A rope rail must be able to withstand a load of 550 N (125 lb.) applied in any direction at any point on the rope rail.

(2) A guardrail system using a rope rail must be installed with sufficient setback from the outer face of the parapet, the floor opening or the open edge of the floor or work surface, as the case may be, or from any other hazard, such that when the rope rail is subjected to a horizontal load of 550 N (125 lb.) applied at any point, the rope rail will not deflect

(a) past the outer face of the parapet,

(b) past the edge of the floor opening,

(c) past the open edge of the floor or work surface, or

(d) into the hazard.

(3) A rope rail must be made of a material that will remain stable and functional, having regard to the following:

(a) climatic conditions;

(b) exposure to,/

(i) high temperature sources, or

(ii) by-products of high temperature processes such as welding or cutting;

(c) chemical exposures that may occur due to

(i) the location of the workplace where the guardrail system is to be installed, or

(ii) the work that will be taking place around or near the guardrail system.

(4) A rope rail must not be made of natural fibre rope or other material relying on natural fibre for tensile strength.

4 Engineering requirements

(1) A rope rail must be installed and used in accordance with written instructions from a professional engineer.

(2) The written instructions required by subsection (1) must include the following:

(a) the seal and signature of the professional engineer providing the written instructions;

(b) the address of and location in the workplace where the guardrail system is to be used;

(c) the name of each employer, prime contractor or owner for whom the written instructions were prepared;

(d) a description of the guardrail system or an illustration for its configuration;

(e) details for the connection of the rope rail to supports and anchors;

(f) details on the size and grade of rope and all required rigging hardware to be used;

(g) details for corner posts and points where rope terminations occur;

(h) the maximum span permitted between supports;

(i) the tension required in the rope and the means to achieve it;

(j) the means for testing rope tension during inspections of the system.

(3) The written instructions for a guardrail system intended for use at a number of workplaces of similar design and construction must include the following:

(a) the seal and signature of the professional engineer providing the written instructions;

(b) a description of the type of structure where the guardrail system may be used;

(c) the name of each employer, prime contractor or owner for whom the written instructions were prepared;

(d) a description of the guardrail system or an illustration for its configuration;

(e) details for the connection of the rope rail to supports and anchors;

(f) details on the size and grade of rope and all required rigging hardware to be used;

(g) details for corner posts and points where rope terminations occur;

(h) the maximum span permitted between supports;

(i) the tension required in the rope and the means to achieve it;

(j) the means for testing rope tension during inspections of the system.

(4) The written instructions must be available at the workplace when the guardrail system is being installed and while the rope rail is in place.

5 Installation and use requirements

(1) A worker involved in the installation, maintenance or removal of a guardrail system described in section 1 *[scope]* must use a fall protection system if required by Part 11 *[Fall Protection]* of this regulation.

(2) A rope rail meeting this standard is intended for use only as a guardrail and must not be used as a horizontal lifeline unless a professional engineer specifically authorizes such use and provides written instructions for such use.

(3) If the lack of visibility of a rope rail is a hazard, high visibility coloured markers or flagging must be installed on the top rail of the guardrail system at intervals not exceeding 2 m (6.5 ft.)

(4) Once installation of a guardrail system described in section 1 *[scope]* is complete and before the system is relied on as the fall protection system for the work area, the employer must ensure the following:

(a) the rope rail and the guardrail system is inspected by a qualified person;

(b) the qualified person is satisfied that the installation conforms to the written instructions of the professional engineer required by section 4 of this Schedule;

(c) the qualified person provides the employer with a written record of the inspection that states that the guardrail system is properly installed;

(d) a copy of the record referred to in paragraph (c) is available at the workplace where the guardrail

system is installed.

(5) In addition to the inspection required by subsection (4), the employer must ensure that the rope rail and the guardrail system is inspected by a qualified person at the start of each work shift to verify that

(a) the rope rail meets the tension requirements of section 3 (1) and (2) of this Schedule, and

(b) the guardrail system conforms to the written instructions referred to in subsection (4) (b) of this section.

(6) If, on inspection under subsection (5) or at any other time, the qualified person or any other person finds that

(a) the rope rail does not meet the tension requirements referred to in subsection (5), or

(b) the guardrail system does not conform to the written instructions referred to in subsection (4) (b),

no work is to take place in the affected area until the deficiency is corrected or the workers in the area are protected by an alternative fall protection system meeting the requirements of Part 11 *[Fall Protection]* of this regulation.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

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4.64 Definitions

In sections 4.64 to 4.69

"brightness ratio" means for any 2 surfaces in the field of vision, the ratio of the luminance of one surface to the luminance of the other surface, expressed as a percentage;

"contrast" means the ratio of the luminance or light coming from an object and the luminance of its immediate background;

"general lighting" means an array of light fixtures that provides a fairly uniform illumination level for a large area, sometimes over the whole workplace, exclusive of any provision for special local lighting;

"glare" means brightness within the field of vision that causes eye fatigue or loss in visual performance;

"illumination level" means the amount of light falling on a surface;

"local lighting" means a light fixture or array of fixtures that provides illumination over a small area such as a service counter in a warehouse, without providing any significant general lighting in the surrounding

area;

"luminance" means the amount of light reflected by a surface at a given angle;

"reflectance" means the ratio of the light reflected from a surface to that falling on the surface, expressed as a percentage.

4.65 Illumination levels

(1)Except as otherwise provided in this section and section 4.69, an employer must provide and maintain minimum illumination levels to ensure safe working conditions, safe passage and the identification of hazards or obstructions as follows:

(a) 22 lux (2 fc) in areas of low activity, such as parking lots, building exteriors, outside areas and basement areas housing machinery, but which are not regular task areas;

(b) 54 lux (5 fc) in areas of high activity, such as frequently used walkways and building access and egress points.

(1.1) Cap lamps or other local sources of illumination acceptable to the Board must be used if the light intensity in a work area is less than 22 lux (2 fc) and it is impracticable to provide illumination by any other means.

(2) For tasks which require the ability to distinguish detail an employer must provide and maintain illumination as required by Table 4-1.

(3) For work processes which require lower illumination levels than those specified in subsections (1) and (2), such as photographic darkrooms, fish hatching rooms and poultry catching operations, the employer may use other effective means to ensure the safety of workers.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

Table 4-1 : Illumination levels for task categories

Task category	Examples[1]	Minimum [2] illumination level in lux
1. Simple orientation for short temporary visits	Inactive storage, waiting areas, VDT screens, log loading and unloading.	50
2. Working spaces where visual tasks are only occasionally performed	Stairways, freight elevators, truck loading, active bulk storage.	100
3. Visual tasks of high contrast or large size	Bakery mixing rooms, hospital central (clean) linen rooms, locker rooms, reading good quality text, casual reading, simple assembly, hand or simple spray painting, rough lumber grading, rough woodworking and benchwork.	200
4. Visual tasks of medium contrast or small size	Hair styling shops, kitchens, vehicle repair garages, sawmill filing room (work areas), reading poor quality text, prolonged or critical reading, medium bench or machine work, mail sorting, fine hand painting and finishing, fine woodworking and finishing.	500
5. Visual tasks of low contrast or very small size	Difficult assembly tasks, difficult inspections, weaving, clothing alteration, finished lumber grading.	1,000
6. Visual tasks of low contrast and very small size over a prolonged period	Very difficult assembly tasks, sewing, fine bench or machine work, extra-fine hand painting and finishing.	2,000
7. Very prolonged and exacting visual tasks	Exacting assembly or inspection, extra fine bench or machine work, precision manual arc-welding.	5,000
8. Very special visual tasks of extremely low contrast and small size	Very detailed cloth product inspection and examination.	10,000

Note 1: Further guidance in determining task categories that apply to specific work areas and activities is contained in the *IES Handbook.* This publication also provides information on acceptable measures to control brightness, reflectance and glare.

Note 2: The lux is the metric unit of light measurement, and replaces the footcandle (fc), which was the traditional imperial unit of measurement. One lux equals about one tenth of a footcandle. For example,

the minimum illumination in footcandles for task category number 4, which is common in the office environment, is about 50 footcandles.

4.66 Means of illumination

The lighting required by section 4.65 must be provided by general or local lighting, or an effective combination of the two.

4.67 Brightness, reflectance and glare

As far as practicable, the workplace must be designed and maintained in such a manner to adequately control

(a) brightness ratios,

(b) reflectance values, and

(c) glare.

4.68 Illumination measurement

(1) The measurement of illumination must be done in accordance with the procedures in the *Lighting Handbook -- Reference and Application, 8th Edition, 1993 (IES Handbook)* published by the Illuminating Engineering Society of North America.

(2) A photometer used to measure illumination levels must be colour and cosine corrected.

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

* See also section 4.4 of the OHS Regulation.

4.69 Emergency lighting

(1) If failure of a lighting system would create conditions dangerous to the health and safety of workers, an emergency lighting system must be provided for the workplace and the exit routes.

(2) An emergency lighting system must provide dependable illumination while the primary lighting system is off to enable all emergency measures to be carried out, including

(a) emergency shutdown procedures, and

(b) evacuation of workers from the premises.

(3) An emergency lighting system in a fixed facility must meet the requirements of section 3.2.7 (Lighting and Emergency Power Systems) of the *BC Building Code* with regard to

(a) illumination level,

(b) use of recessed fixtures,

(c) duration of emergency lighting,

(d) the use of self-contained emergency lighting units, and

(e) emergency electrical power supply.

(4) The emergency lighting system must be inspected, tested and maintained to meet the requirements of section 6.5 (Emergency Power Systems and Unit Equipment for Emergency Lighting) of the *BC Fire Code*.

[Amended by B.C. Reg. 199/2014, effective February 1, 2015.]

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4.70 Application

Sections 4.71 to 4.80 apply to indoor or enclosed areas when occupied by workers, except

(a) a controlled atmosphere enclosure,

(b) a confined space, and

(c) when clearly impracticable, such as during some construction or renovation projects.

4.71 Submitting plans

An employer or the employer's agent must submit to the Board drawings and specifications for an existing or proposed ventilation system when requested by the Board.

4.72 Design and operation

(1) An employer must ensure that a ventilation system for the supply and distribution of air and removal of indoor air contaminants is designed, constructed and operated in accordance with

(a) established engineering principles, and

(b) *ASHRAE Standard 62-1989, Ventilation for Acceptable Indoor Air Quality*.

(2) An adequate supply of outdoor air must be provided to the workplace in accordance with Table 2 of *ASHRAE Standard 62-1989*.

(3) For a building ventilation system installed prior to 1989, an adequate supply of outdoor air must be provided in accordance with the ASHRAE standard in place at the time the ventilation system was

designed.

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

* See also section 4.4 of the OHS Regulation.

Note: If workers occupying a building exhibit signs or report symptoms of illness the circumstances must be investigated as required by Part 5 (Chemical Agents and Biological Agents). If such signs or symptoms are attributed to an inadequate supply of outdoor air, the Board will, under subsection (3), consider a standard other than the ASHRAE standard in place at the time the ventilation system was designed where necessary to address the circumstances.

4.73 Building modifications

The owner of a building must permit an employer to install a ventilation system when required by this Part, provided that all such work is subject to the approval of the owner, acting reasonably.

4.74 Distribution

Outdoor air must be effectively distributed throughout the workplace.

4.75 Balancing

The ventilation system must be balanced to

(a) ensure that each space within the building receives an adequate allotment of outdoor air, and

(b) accommodate the actual or the normally anticipated occupancy of each space.

4.76 Ventilation openings

(1) A ventilation system must not be obstructed by material or equipment placed in front of the ventilation air intakes or discharge points.

(2) Outdoor air intakes must be located so that outdoor air entering the ventilation system does not contain any contaminant in a concentration greater than normal outdoor ambient air in that locality.

4.77 Discharged air

A ventilation system that discharges air from the work area must be designed to minimize the likelihood of exposing any worker at a workplace, including an adjacent workplace

(a) to an air contaminant in a concentration which exceeds either 10% of its applicable exposure limit in Part 5 (Chemical Agents and Biological Agents), or an acceptable ambient air quality standard established by an authority having jurisdiction over environmental air standards, whichever is greater, and

(b) where practicable, to an objectionable odour.

4.78 Preventive maintenance

(1) To maintain acceptable air quality, the employer, or if the employer is not responsible for maintenance of the ventilation system, the owner of the ventilation system must establish an effective preventive maintenance program for the ventilation system.

(2) Preventive maintenance must include

(a) regular inspections

(i) of all critical components of the ventilation system, such as dampers, fans, belts, baffles, ductwork, diffusers and control systems, and

(ii) for conditions which would promote the growth of micro-organisms, such as water leaks or stagnant water pools,

(b) correction of any deficiencies found during the inspections carried out under paragraph (a),

(c) repair or replacement of malfunctioning and consumable components, such as filters and belts, and the cleaning of air distribution systems, ducts and dampers when necessary to correct an indoor air quality deficiency,

(d) adequate treatment of open water systems associated with ventilation equipment such as cooling towers and humidifiers, to control biological growth, and

(e) maintenance of combustion sources, such as furnaces, space heaters and water heaters to assure proper burning and exhausting of waste gases so that recirculation of gases to the workplace will not occur.

4.79 Investigation

(1) The employer must ensure that the indoor air quality is investigated when

(a) complaints are reported,

(b) occupancy in the space changes substantially, or

(c) renovations involving significant changes to the ventilation system occur.

(2) An air quality investigation must include

(a) assessment of the ventilation rate, unless the indoor carbon dioxide level is less than 650 ppm above ambient outdoor levels,

(b) inspection of the ventilation system as required in section 4.78(2),

(c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints, and

(d) a record of the complaint, the findings of the investigation, and any actions taken.

Note: In subsection (2)(a) carbon dioxide is considered a marker indicator of sufficient outdoor air, not

as a toxic air contaminant for which the exposure limit established by section 5.48 would apply. Normally, ambient levels are approximately 350 ppm, but may be higher in locations such as urban areas or during weather conditions such as inversions. Ambient levels may be assumed to be 350 ppm unless sampling establishes otherwise.

4.80 Temperature and humidity

The employer must ensure that temperature and humidity levels within the indoor work environment are maintained within acceptable comfort ranges, as far as is practicable.

Note: Refer to the ASHRAE publication *Handbook of Fundamentals* or to the WorkSafeBC publication *Indoor Air Quality* [PDF 1.5 MB] for information on acceptable temperature and humidity levels.

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4.81 Controlling exposure

The employer must control the exposure of workers at any workplace to environmental tobacco smoke by

(a) prohibiting smoking in the workplace,

(b) restricting smoking to a safe outdoor location that is a minimum of 3 metres from a doorway, window or air intake of an indoor workplace, subject to section 4.22 (3) of the Tobacco Control Regulation, B.C. Reg. 232/2007, and

(c) prohibiting working in an indoor area where smoking is allowed under section 4.23 (2) (a) or (b) of the Tobacco Control Regulation, except as permitted in section 4.82 of this regulation.

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

4.82 Exceptions

(1) An employer must ensure that a worker does not work in an indoor area where smoking is permitted under section 4.23 (2) (a) or (b) of the Tobacco Control Regulation, B.C. Reg. 232/2007, unless

(a) the worker must enter the area to respond to an emergency endangering life, health or property,

(b) the worker must enter the area to investigate for illegal activity, or

(c) the tobacco smoke has been effectively removed.

(2) If necessary to prevent tobacco smoke from entering a workplace, a room where smoking is permitted

under section 4.23 (2) (a) of the Tobacco Control Regulation, B.C. Reg. 232/2007, must be provided with a separate, non-recirculating exhaust ventilation system that

(a) is designed in accordance with expected occupancy rates,

(b) maintains adequate air flows from non-smoking to smoking areas,

(c) discharges directly to the outdoors, and

(d) meets all other requirements for a smoking lounge

specified in the *American Society of Heating, Refrigerating and Air-conditioning Engineers Standard 62-1989, Ventilation for Acceptable Indoor Air Quality*.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

4.83 Public entertainment facilities

Repealed. [B.C. Reg. 258/2008, effective January 1, 2009.]

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4.84 Eating areas

(1) Workers must not keep or consume food in an area of a workplace where it could become unwholesome because of workplace contaminants.

(2) The employer must ensure that an area suitable for the storage and consumption of food is provided for workers if

(a) there is a risk that food stored or consumed at a workplace may become unwholesome because of workplace contaminants, or

(b) food storage or consumption is restricted or prohibited at the workplace.

[Enacted by B.C. Reg. 421/2004, effective January 1, 2005.]

4.85 Washroom facilities

(1) Except as provided by subsection (2), the employer must ensure that a sufficient number of plumbed washroom facilities are readily available for workers.

(2) If plumbed washroom facilities cannot be provided because of the nature of the workplace or the

nature of the work in which the worker is involved, the employer must

(a) provide access to portable washroom and hand-washing facilities, or

(b) make such other reasonable arrangements to accommodate workers as the circumstances allow, if access to portable washroom and hand-washing facilities cannot be provided.

(3) If washroom facilities are provided they must be

(a) maintained in proper working order,

(b) kept clean and sanitary, and

(c) provided with the supplies necessary for their use.

[Enacted by B.C. Reg. 421/2004, effective January 1, 2005.]

4.86 Change areas

If the employer requires the worker to change into protective work clothing at the workplace, the employer must ensure that adequate change areas are provided.

[Enacted by B.C. Reg. 421/2004, effective January 1, 2005.]

4.87 Unsafe water

The employer must display at every plumbed non-potable water source from which a person might reasonably believe he or she can safely drink, a notice that the water is unfit for human consumption.

[Enacted by B.C. Reg. 421/2004, effective January 1, 2005.]

Sections 4.88 to 4.106

Repealed. [B.C. Reg. 421/2004, effective January 1, 2005.]

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TABLE 5-4: EXPOSURE LIMITS AND DESIGNATIONS [Repealed]
Please refer to Table of Exposure Limits for Chemical and Biological Substances

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5.1 Definitions

In this Part

"8-hour TWA limit" means the time weighted average (TWA) concentration of a substance in air which may not be exceeded over a normal 8 hour work period;

"ACGIH" means

(a) the American Conference of Governmental Industrial Hygienists publication entitled *Threshold Limit Values and Biological Exposure Indices, dated 2002*, as amended from time to time, or

(b) the American Conference of Governmental Industrial Hygienists publication entitled *Documentation of the Threshold Limit Values and Biological Exposure Indices*, as amended from time to time;

"adverse health effect" means an acute or chronic injury, acute or chronic disease, or death;

"approved storage area" means a storage area which meets the requirements of article 4.2.7.5 of the *BC Fire Code;*

"approved storage cabinet" means a flammable liquids storage cabinet which bears a UL or ULC approval label for this purpose or which otherwise meets the requirements of subsection 4.2.10 of the *BC Fire Code;*

"approved storage room" means a room for container storage which meets the requirements of section 4.2.9 of the *BC Fire Code;*

"as low as reasonably achievable" or *"ALARA"* means, in reference to a substance, that measures must be taken to keep a worker's exposure to a level as low as is reasonably achievable;

"bulk shipment" means a shipment of a hazardous product that is contained in any of the following, without intermediate containment or intermediate packaging:

(a) a vessel that has a water capacity equal to or greater than 450 litres;

(b) a freight container, road vehicle, railway vehicle or portable tank;

(c) the hold of a ship;

(d) a pipeline;

"carcinogen" means a substance or a mixture of substances which is identified as a carcinogen in section 5.57(1), or

(a) causes an increased incidence of benign or malignant neoplasms, or

(b) substantially decreases the latency period between exposure and onset of neoplasms in humans, or

(c) results in the induction of tumors at a site other than the site of administration in one or more experimental mammalian species as a result of any oral, respiratory, or dermal exposure, or any other exposure, or

(d) is metabolized into one or more potential occupational carcinogens by mammals;

"CAS registry number" means the identification number assigned to a chemical by the Chemical Abstracts Service, a division of the American Chemical Society;

"ceiling limit" means the concentration of a substance in air which may not be exceeded at any time during the work period;

"compressed gas" means a substance that meets the criteria for Physical Hazard Class — Gases Under Pressure, Part 7, Subpart 5 of the HPR;

"container" includes a bag, barrel, bottle, box, can, cylinder, drum or similar package or receptacle, but does not include a storage tank;

"continuous flow emergency shower facility" means a facility capable of delivering water with a spray pattern designed to effectively flush affected areas of the skin;

"continuous flow eyewash facility" means a plumbed or portable facility capable of delivering a minimum of 1.5 litres of water per minute (0.33 imp gal per min) with a water pressure not exceeding 175 kPa (25 psi) and with a spray pattern designed to effectively flush both eyes;

"drench hose" means a flexible hose connected to a water supply and capable of delivering a minimum of 11.4 litres of water per minute (2.5 imp gal per min), for use to flush the eyes and/or skin;

"flammable gas" means a substance that meets the criteria for Physical Hazard Class — Flammable Gases, Part 7, Subpart 2 of the HPR;

"fugitive emission" means a gas, liquid, solid, vapour, fume, mist, fog or dust that escapes from process equipment, emission control equipment or from a product where workers may be readily exposed;

"hazard information" means information on the proper and safe use, storage and handling of a hazardous product and includes information related to its health and physical hazards;

"Hazardous Materials Information Review Act" or "HMIRA" means the *Hazardous Materials Information Review Act* (Canada);

"Hazardous Products Act" or "HPA" means the *Hazardous Products Act* (Canada);

"Hazardous Products Regulations" or "HPR" means the Hazardous Products Regulations (Canada);

"hazardous waste" means a hazardous product that is acquired or generated for recycling or recovery or is intended for disposal;

"hazardous waste profile sheet" means a written description of the hazardous waste which identifies its hazardous characteristics, hazardous ingredients, and prescribes safe work procedures for handling, storing, using and disposing of the waste;

"IARC" means the International Agency for Research on Cancer publication *Monographs on the Evaluation of Carcinogenic Risks to Humans*, as amended from time to time;

"label" means a group of written, printed or graphic information elements that relate to a hazardous product, which group is designed to be affixed to, printed on or attached to the hazardous product or the container in which the hazardous product is packaged;

"laboratory sample" means a sample of a hazardous product that is packaged in a container that contains less than 10 kg of the hazardous product and is intended solely to be tested in a laboratory, but does not include a sample that is to be used

(a) by the laboratory for testing other products, mixtures, materials or substances, or

(b) for educational or demonstration purposes;

"manufactured article" means an article that is formed to a specific shape or design during manufacture, the intended use of which, when in that form, is dependent in whole or in part on its shape or design and that, under normal conditions of use, will not release or otherwise cause an individual to be exposed to a hazardous product;

"personal eyewash unit" means an eyewash that supplements an emergency eyewash facility by delivering immediate flushing for less than 15 minutes;

"portable tank" means a closed container that is designed to be movable while containing liquid, which is equipped with skids, mountings or accessories to facilitate handling of the tank by mechanical means and is not permanently attached to a transporting vehicle, as defined in the *BC Fire Code;*

"product identifier" means, in respect of a hazardous product, the brand name, chemical name, common name, generic name or trade name;

"readily available" means, when used in connection with an SDS, present in an appropriate place and in the form of either

(a) a physical copy that can be handled, or

(b) an electronic copy,

that is accessible to a worker at all times;

"short-term exposure limit" or *"STEL"* means the time weighted average (TWA) concentration of a substance in air which may not be exceeded over any 15 minute period, limited to no more than 4 such periods in an 8 hour work shift with at least one hour between any 2 successive 15 minute excursion periods;

"significant new data" means new data regarding the hazard presented by a hazardous product that change its classification in a category or subcategory of a hazard class, or result in its classification in another hazard class, or change the ways to protect against the hazard presented by the hazardous product;

"storage tank" means a closed container that has a capacity of more than 250 litres (55 imp gal) and is designed to be installed in a fixed location, as defined in the *BC Fire Code;*

"supplementary eyewash facility" means a personal eyewash unit or a drench hose;

"supplier label" means a label provided by a supplier that contains the information elements required by the *Hazardous Products Act*;

"tempered" means maintained at temperatures from 15°C to 30°C (60°F to 85°F);

"temporary" means non-routine work, and does not refer to routine work of short duration;

"workplace label" means a label that discloses

(a) a product identifier that is identical to that found on the SDS of the corresponding hazardous product,

(b) information for the safe handling of the hazardous product that is conveyed in a manner appropriate to the workplace, and

(c) that an SDS, if supplied or produced, is available.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 319/2007, effective February 1, 2008.]

[Amended by B.C. Reg.258/2008, effective January 1, 2009.]

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.1.1 Designation as hazardous substances

For the purposes of sections 5.2 and 6.33 to 6.40 and Part 30, the following biological agents are designated as hazardous substances:

(a) a liquid or solid material that is contaminated with a prion, virus, bacterium, fungus or other biological agent that has a classification given by the Public Health Agency of Canada as a Risk Group 2, 3 or 4 human pathogen that causes an adverse health effect;

(b) a biological toxin that causes an adverse health effect.

[Enacted by B.C. Reg. 319/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

5.2 General information requirement

If a worker is or may be exposed to a chemical agent, or biological agent designated as a hazardous substance in section 5.1.1, which could cause an adverse health effect, the employer must ensure that

(a) the identity of the chemical agent or biological agent, its possible effects on worker health and safety and any precautions required to protect the health and safety of the worker are clearly indicated by labels, SDSs, or other similar means,

(b) the information required by paragraph (a) is clearly communicated to the worker,

(c) written procedures are prepared and implemented to eliminate or minimize a risk of exposure to a chemical agent or biological agent by any route that could cause an adverse health effect, and to address emergency and cleanup procedures in the event of a spill or release of a chemical agent or biological agent, and

(d) the supervisor and the worker are trained in and follow the measures required in this Part and Part 6

of this Regulation for the safe handling, use, storage and disposal of the chemical agent or biological agent, including emergency and spill cleanup procedures.

[Amended by B.C. Reg. 319/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

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5.3 Application

(1) Subject to subsections (2) to (4), sections 5.4 to 5.18 (the WHMIS Requirements) apply to employers and workers with respect to hazardous products used, stored or handled at a workplace.

(2) The provisions concerning a supplier label and SDS do not apply if the hazardous product is

(a) an explosive as defined in section 2 of the *Explosives Act* (Canada),

(b) a drug, food or cosmetic device within the meaning of the *Food and Drugs Act* (Canada),

(c) a pest control product as defined in section 2(1) of the *Pest Control Products Act* (Canada),

(d) a nuclear substance as defined in section 2 of the *Nuclear Safety and Control Act* (Canada), that is radioactive, or

(e) a consumer product as defined in section 2 of the *Canada Consumer Product Safety Act*.

(3) The provisions do not apply if the hazardous product is

(a) wood or a product made of wood,

(b) tobacco or a tobacco product as defined in section 2 of the *Tobacco Act* (Canada),

(c) a manufactured article, or

(d) being transported or handled pursuant to the requirements of the *Transportation of Dangerous Goods Act, 1992* (Canada) or the *Transport of Dangerous Goods Act*.

(4) The provisions do not apply to a hazardous waste, except that the employer must ensure the safe storage and handling of a hazardous waste generated at the workplace through the combination of worker training and the information required by this Regulation.

[Amended by B.C. Reg. 199/2014, effective February 1, 2015.]

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.4 Prohibition

(1) Subject to subsection (2), an employer must ensure that a hazardous product is not used, stored or handled in a workplace unless all the applicable WHMIS Requirements concerning labels, product identifiers, SDSs and worker education and training are complied with.

(2) An employer may store a hazardous product in a workplace while actively seeking information required by subsection (1).

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.5 WHMIS program

If hazardous products are used in the workplace the employer, in consultation with the joint committee or health and safety representative, as applicable, must establish and maintain an effective WHMIS program, as part of the overall workplace health and safety program, which

(a) addresses applicable WHMIS Requirements including education and training,

(b) is reviewed at least annually, or more frequently if required by a change in work conditions or available hazard information, and

(c) provides for the periodic evaluation of the knowledge of workers using suitable means such as written tests and practical demonstrations.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.6 Worker education

(1) An employer must ensure that general WHMIS education, as it pertains to the workplace, is provided to workers on the

(a) elements of the WHMIS program,

(b) major hazards of the hazardous products in use in the workplace,

(c) rights and responsibilities of employers and workers, and

(d) content required on labels and SDSs, and the significance of this information.

(2) The employer must ensure that a worker who works with a hazardous product or may be exposed to a hazardous product in the course of his or her work activities is informed about all hazard information received from the supplier concerning that hazardous product as well as any further hazard information of which the employer is aware or reasonably ought to be aware concerning the use, storage and handling of that hazardous product.

(3) If a hazardous product is produced in a workplace, the employer must ensure that a worker who works with or in proximity to the hazardous product or may be exposed to the hazardous product in the course of his or her work activities has access to all hazard information of which the employer is aware or reasonably ought to be aware concerning the use, storage and handling of that hazardous product.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.7 Worker training

(1) An employer must ensure that a worker who works with a hazardous product or may be exposed to a hazardous product in the course of his or her work activities is trained in the following:

(a) the content required on a supplier label and workplace label, and the purpose and significance of the information contained on those labels;

(b) the content required on an SDS and the purpose and significance of the information contained on the SDS;

(c) procedures for the safe use, storage, handling and disposal of the hazardous product;

(d) procedures for the safe use, handling and disposal of the hazardous product contained or transferred in

(i) a pipe or a piping system including valves,

(ii) a process or reaction vessel, or

(iii) a tank car, tank truck, ore car, conveyor belt or similar conveyance;

(e) procedures to be followed where fugitive emissions are present if workers may be exposed to those fugitive emissions;

(f) procedures to be followed in case of an emergency involving the hazardous product.

(2) Instruction required by subsection (1) must be specific to the workplace and cover the safe work procedures and emergency response procedures to be used in the workplace.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.8 Supplier label

(1) Subject to any exemptions from labelling requirements in the Hazardous Products Regulations and this Part, an employer must ensure that a hazardous product or the container of a hazardous product received at a workplace is attached or printed with a supplier label.

(2) Subject to any exemptions from labelling requirements in the Hazardous Products Regulations and this Part, an employer must not remove, deface, modify or alter the supplier label, as long as any amount of a hazardous product remains in a workplace in the container in which it was received from the supplier.

(3) Subject to any exemptions from labelling requirements in the Hazardous Products Regulations and this Part, an employer must replace the label with either a supplier label or a workplace label if a supplier label applied to a hazardous product or a container of a hazardous product becomes illegible or is accidentally removed from the hazardous product or the container.

(4) If an employer imports and receives a hazardous product under the Hazardous Products Regulations

at the workplace, without a supplier label or with a supplier label that does not comply with the Hazardous Products Regulations, the employer must affix a workplace label that meets the requirements of the Hazardous Products Regulations.

(5) The employer must update the labels or the information on containers as soon as significant new data is provided to the employer by the supplier.

(6) An employer who has received an unpackaged hazardous product or a hazardous product transported as a bulk shipment, to which, under the exemption in the Hazardous Products Regulations, a supplier label has not been affixed or attached, must apply a label having the information required of a supplier label to the container of the hazardous product or to the hazardous product in the workplace.

(7) Subsections (2) and (3) do not apply if a label is removed under normal conditions of use of a hazardous product that is in a container that has a capacity of 3 ml or less and the label interferes with the normal use of the product.

[Enacted by B.C. Reg. 30/2015, effective August 4, 2015.]

5.9 Workplace label for employer-produced products

(1) If an employer produces a hazardous product at a workplace, the employer must ensure that a workplace label is applied to the hazardous product or the container of the hazardous product

(2) For purposes of subsection (1), "produces" does not include the escape of a hazardous product from equipment or from another product.

(3) Subsection (1) does not apply if the hazardous product is in a container that is intended to contain the hazardous product for sale or disposition and the container is or is about to be appropriately labelled.

(4) The employer must update the workplace label for a hazardous product produced by the employer as soon as significant new data are available to the employer.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.10 Workplace label for decanted products

(1) If a hazardous product in a workplace is in a container other than the container in which it was received from a supplier, the employer must ensure that the container has a workplace label applied to it.

(2) Subsection (1) does not apply to a portable container that is filled directly from a container that has a supplier label or workplace label applied to it

(a) if the hazardous product

(i) is under the control of and is used exclusively by the worker who filled the portable container,

(ii) is used only during the shift in which the portable container was filled, and

(iii) the content of the container is clearly identified, or

(b) if all of the hazardous product is required for immediate use.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.11 Piping systems and vessels

If a hazardous product in a workplace is contained or transferred in

(a) a pipe, or piping system including valves,

(b) a process or reaction vessel, or

(c) a tank car, tank truck, ore car, conveyor belt or similar conveyance,

the employer must ensure the safe use, storage and handling of the hazardous product through worker training and the use of labels, placards, or colour coding or any other mode of identification.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.12 Placard identifiers

If the hazardous product is not in a container or is in a container in a form intended for export, the employer may fulfill the labelling requirements under sections 5.8 to 5.10 by posting a placard which

(a) discloses the information required for a workplace label, and

(b) is of a size and in locations so that the information is conspicuous and clearly legible to workers.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.13 Laboratory label

(1) If a laboratory sample of a hazardous product is the subject of a labelling exemption under the Hazardous Products Regulations, a label provided by the supplier and affixed to, printed on or attached to the container of the product received at the workplace that discloses the following information in place of the information required under the Hazardous Products Regulations complies with the requirements of section 5.8 of this Part with respect to a supplier label:

(a) the chemical name or generic chemical name of any material or substance in the hazardous product that, individually, is classified, pursuant to the *Hazardous Products Act* and the Hazardous Products Regulations, in any category or subcategory of a health hazard class and is present above the relevant concentration limit, or is present at a concentration that results in the mixture being classified in a category or subcategory of any health hazard class, if known by the supplier;

(b) the statement "Hazardous Laboratory Sample. For hazard information or in an emergency, call / Échantillon pour laboratoire de produit dangereux. Pour obtenir des renseignements sur les dangers ou en cas d'urgence, composez" followed by an emergency telephone number for the purpose of obtaining information that must be provided on the SDS of the hazardous product.

(2) If a hazardous product is in a container other than the container in which it was received from a supplier, or is produced in the workplace, the employer is exempt from the requirement set out in section 5.10 if the hazardous product

(a) is a laboratory sample,

(b) is intended by the employer solely for use, analysis, testing or evaluation in a laboratory, and

(c) is clearly identified through a combination of

(i) a mode of identification visible to workers at the workplace, and

(ii) worker education and training required by this Part.

(3) The employer must ensure that the mode of identification and worker education and training referred to in subsection (2)(c) enable the worker to readily identify and obtain either the information required on an SDS, if one has been produced, or a label or document disclosing the information referred to in subsection (1)(a) and (b) with respect to the hazardous product or the laboratory sample.

[Enacted by B.C. Reg. 30/2015, effective August 4, 2015.]

5.14 Supplier SDS

(1) Subject to subsection (6), an employer who acquires a hazardous product for use, handling or storage at a workplace must obtain a supplier SDS in respect of that hazardous product that complies with the requirements of the Hazardous Products Regulations.

(2) When a supplier SDS obtained under subsection (1) for a hazardous product is 3 years old, the employer must obtain from the supplier an up-to-date supplier SDS in respect of any of that hazardous product in the workplace at that time.

(3) Subsection (2) does not apply if

(a) the employer has obtained written confirmation from the supplier that

(i) the SDS has not changed, or

(ii) the up-to-date supplier SDS does not apply to the hazardous product, or

(b) it is not practicable for the employer to obtain the up-to-date SDS or written confirmation under paragraph (a).

(4) If the employer is unable to obtain an SDS as required by subsection (2), the employer must add to the existing supplier SDS any significant new data or new hazard information applicable to that hazardous product that the employer is aware of, or ought reasonably to be aware of, on the basis of the ingredients disclosed in that document.

(5) The employer may provide at a workplace an SDS in a format different from the format provided by the supplier or containing additional hazard information if the SDS provided by the employer

(a) subject to section 5.18, contains no less content than the supplier SDS, and

(b) the supplier SDS is available at the workplace and the employer-provided SDS indicates that fact.

(6) If a supplier is exempted by the Hazardous Products Regulations from the requirement to provide an SDS for a hazardous product, the employer is exempt from the requirement to obtain and provide an SDS

for that hazardous product.

[Enacted by B.C. Reg. 30/2015, effective August 4, 2015.]

5.15 Employer SDS

(1) If an employer produces a hazardous product in the workplace, the employer must prepare an SDS in respect of that product that discloses, subject to section 5.18, the information required under the Hazardous Product Regulations.

(2) For the purpose of subsection (1), "produces" does not include the escape of a hazardous product from equipment or from another product nor does it include intermediate products undergoing reaction within a reaction or process vessel.

(3) The employer must update the SDS referred to in subsection (1) as soon as practicable after significant new data or new hazard information becomes available to the employer.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.16 Availability of an SDS

(1) An employer must ensure that a copy of an SDS required by sections 5.14 or 5.15 is made readily available

(a) at the workplace to workers who may be exposed to the hazardous product, and

(b) to the joint committee or to the worker health and safety representative, as applicable.

(2) If an employer is required by subsection (1) to make an SDS readily available, the joint committee or worker health and safety representative, as applicable, must be consulted on the means on how best to achieve SDS accessibility in the workplace.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.16.1 Availability of toxicological data NEW

Subject to section 5.18, if an employer manufactures a hazardous product in a workplace, the employer must disclose as quickly as practicable the source of any toxicological data used in preparing the SDS required by section 5.15(1), at the request of

(a) any concerned worker at the workplace, the joint committee or the worker health and safety representative,

(b) the representative of the workers at the workplace, in the absence of a joint committee or worker health and safety representative, or

(c) the Board.

[Enacted by B.C. Reg. 30/2015, effective August 4, 2015.]

5.17 Deletions from an SDS

If an employer claims an exemption under section 5.18, the employer may delete the information that is the subject of the claim from the SDS required by sections 5.14 and 5.15 for the time period in section 5.18(8), but may not delete hazard information.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.18 Confidential business information and claims for exemption under the HMIRA

(1) An employer who is required, under this Regulation, to disclose any of the following information on a label or SDS may, if the employer considers it to be confidential business information, claim an exemption from the requirement to disclose the information:

(a) in the case of a material or substance that is a hazardous product,

(i) the chemical name of the material or substance,

(ii) the CAS registry number, or any other unique identifier, of the material or substance, and

(iii) the chemical name of any impurity, stabilizing solvent or stabilizing additive that is present in the material or substance, that is classified in a category or subcategory of a health hazard class under the *Hazardous Products Act* and that contributes to the classification of the material or substance in the health hazard class under that Act;

(b) in the case of an ingredient that is in a mixture that is a hazardous product,

(i) the chemical name of the ingredient,

(ii) the CAS registry number, or any other unique identifier, of the ingredient, and

(iii) the concentration or concentration range of the ingredient;

(c) in the case of a material, substance or mixture that is a hazardous product, the name of any toxicological study that identifies the material or substance or any ingredient in the mixture;

(d) the product identifier of a hazardous product, being its chemical name, common name, generic name, trade name or brand name;

(e) information about a hazardous product, other than the product identifier, that constitutes a means of identification;

(f) information that could be used to identify a supplier of a hazardous product.

(2) A claim under subsection (1) must be made under the *Hazardous Materials Information Review Act* and must be filed in accordance with the procedures established under that Act and the regulations made under it.

(3) An employer is deemed to comply with section 5.15 of this Regulation if the employer produces a hazardous product in the workplace and files a claim for exemption under subsection 11(2)(a) or (b)(i) or (ii) of the *Hazardous Materials Information Review Act*, and the employer prepares an SDS in respect of that hazardous product that discloses the following in place of the information elements listed in section

3(1)(a), (b), (c) and (d) or 3(2)(a), (b) and (c) of Schedule 1 of the Hazardous Products Regulations:

(a) in the case of a hazardous product that is a material or substance, the generic chemical name of the material or substance;

(b) in the case of a hazardous product that is a mixture, the generic chemical name of each material or substance in the mixture that, individually, is classified in any category or subcategory of a health hazard class and is present above the applicable concentration limit or is present at a concentration that results in the mixture being classified in a category or subcategory of any health hazard class.

(4) An employer is deemed to comply with section 5.15 of this Regulation if the employer produces a hazardous product in the workplace and files a claim for exemption under subsection 11(2)(b)(iii) of the *Hazardous Materials Information Review Act*, and the employer prepares an SDS in respect of that hazardous product that does not disclose the information element listed in section 3(2)(d) of Schedule 1 of the Hazardous Products Regulations.

(5) An employer is deemed to comply with section 5.15 of this Regulation if the employer produces a hazardous product in the workplace and files a claim for exemption under subsection 11(2)(d) of the *Hazardous Materials Information Review Act*, and the employer prepares an SDS in respect of that hazardous product that discloses, in place of the product identifier, a code name or code number for the product.

(6) An employer who files a claim for exemption from a requirement to disclose information in respect of a hazardous product on an SDS or on a label must disclose on the SDS and, where applicable, on the label of the hazardous product or the container of the hazardous product,

(a) the date that the claim for exemption was filed, and

(b) the registry number assigned to the claim under the *Hazardous Materials Information Review Act*.

(7) The requirements referred to in subsection (6) apply until

(a) in the case of an order that was issued by a screening officer under the *Hazardous Materials Information Review Act*, the end of the period that begins on the final disposition of the proceedings under that Act in relation to the claim for exemption and does not exceed the period specified in the order, or

(b) in any other case, the end of the period not exceeding 30 days after the final disposition of the proceedings in relation to the claim for exemption.

(8) Information that an employer considers to be confidential business information is exempt from disclosure from the time a claim is filed under subsection (2) until the final disposition of the proceedings under the *Hazardous Materials Information Review Act* in relation to the claim and for a period of 3 years after that if the claim is found to be valid.

(9) An employer who receives notice of a decision made under the *Hazardous Materials Information Review Act* that the employer's claim or a portion of the employer's claim for exemption from a requirement to provide information in respect of a hazardous product on an SDS or a label is valid must, during the period beginning no later than the end of the applicable period specified in subsection (7) of this section and on compliance with any order issued under subsection 16(1) or 17(1) of the *Hazardous Materials Information Review Act*, if applicable, and ending on the last day of the exemption period, in respect of the sale or importation of the hazardous product, disclose on the SDS and, if applicable, on the

label of the hazardous product or container in which the hazardous product is packaged, the following information:

(a) a statement that an exemption has been granted;

(b) the date of the decision granting the exemption;

(c) the registry number assigned to the claim under the *Hazardous Materials Information Review Act*.

(10) An employer who makes a claim under subsection (1) must abide by the decisions and orders issued under the *Hazardous Materials Information Review Act*.

(11) An appeal from a decision or order referred to in subsection (10) may be made under and in accordance with the *Hazardous Materials Information Review Act* and any regulations made under that Act.

[Enacted by B.C. Reg. 30/2015, effective August 4, 2015.]

5.19 Claims under the *HMIR Act*

Repealed. [B.C. Reg. 30/2015, effective August 4, 2015.]

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5.20 Condition of containers

The container of a hazardous substance must be designed, constructed and maintained in good condition to securely contain the substance.

5.21 Material integrity

Any material used to contain, transfer or convey a hazardous substance must be reasonably resistant to the substance and to any other substance to which it may be exposed.

5.22 Covers

If an open container of a hazardous substance could pose a hazard, the container must be kept sealed or covered when not in use.

5.23 Permitted quantities

(1) The amount of a hazardous substance in a work area must not exceed the quantity reasonably needed

for work in progress, normally in one work shift.

(2) Bulk or reserve quantities must be stored in a designated area separate from the work area.

5.24 Incompatible substances

Substances which are incompatible must not be stored in a manner that would allow them to mix in the event of container leakage, breakage or other such circumstance.

5.25 Storage practices

A hazardous substance must be stored in a designated area, in a manner which ensures that it will not readily fall, become dislodged, suffer damage, or be exposed to conditions of extreme temperature.

5.26 Storage area

The designated storage area for a hazardous substance must be

(a) designed and constructed to provide for the safe containment of the contents,

(b) clearly identified by signs, placards or similar means,

(c) designed and maintained to allow the safe movement of workers, equipment and material,

(d) provided with adequate ventilation and lighting, and

(e) in a location not normally occupied by workers, and not in a location such as a lunchroom, eating area, change room, clothing storage locker or passenger compartment of a vehicle.

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5.27 Ignition sources

(0.1) In this section, *"B.C. Electrical Code"* has the same meaning as in the Electrical Safety Regulation.

(1) When a flammable gas or a flammable liquid is handled, used or stored, all sources of ignition must be eliminated or adequately controlled.

(2) For the purposes of subsection (1) sources of ignition include open flame, spark-producing mechanical equipment, welding and cutting processes, smoking, static discharge and any electrical equipment or installation that is not approved in the B.C. Electrical Code for use in hazardous locations.

(3) If the work involves more than one employer, the principal contractor or, if there is no principal

contractor, the owner must ensure that sources of ignition resulting from the work of one employer are eliminated or adequately controlled in any work area where a flammable gas or a flammable liquid is handled, used or stored by any other employer.

[Amended by B.C. Reg. 199/2014, effective February 1, 2015.]

5.28 Grounding or bonding

Metallic or conductive containers used to transfer flammable liquids must be electrically bonded to each other or electrically grounded while their contents are being transferred from one container to the other.

5.29 Electrostatic charge

If glass, plastic or other non-conductive container with a capacity of 23 litres (5 imp gal) or more is used to transfer a flammable liquid, the accumulation of electrostatic charge near the surface of the liquid must be eliminated or controlled by

(a) limiting the flow velocity of the liquid to less than 1 m/s (200 fpm),

(b) using a grounded lance or nozzle extending to the bottom of the container,

(c) limiting free fall,

(d) using anti-static additives, or

(e) other effective means.

5.30 Dispensing

If a flammable liquid is dispensed or transferred inside a flammable liquids storage room,

(a) the storage room must be mechanically ventilated at a rate of at least 18 m^3/hr per square metre of floor area (1 cfm/sq ft), but not less than 250 m^3/hr (150 cfm),

(b) exhaust air must be discharged to the outdoors, and makeup air provided,

(c) any makeup air duct passing through a fire separation must be equipped with an approved fire damper, and

(d) doors must be self-closing.

5.31 Flammable gas or vapour

If it is not practicable to maintain the airborne concentration of a flammable gas or vapour below the applicable exposure limit, for example, in a temporary situation or an emergency,

(a) only the minimum number of workers necessary for the work may be exposed,

(b) every worker exposed must be adequately trained and equipped to safely perform the required duties,

(c) the concentration of the flammable gas or vapour must not exceed 20% of the lower explosive limit (LEL), and

(d) in a life-threatening emergency only, exposure of emergency response workers is permitted above 20% of the LEL, provided that only those qualified and properly trained and equipped workers necessary to correct the unsafe condition are exposed to the hazard and every possible effort is made to control the hazard while this is being done.

5.32 Manual cleaning

A flammable liquid must not be used as a manual cleaning solvent unless

(a) a thorough review of alternative solvents by the employer indicates that a suitable non-flammable substitute is not available,

(b) appropriate written safe work procedures are implemented to effectively control flammability and health hazards,

(c) the quantity of liquid used is minimized,

(d) the worker is instructed and trained in the safe work procedures, and

(e) the work procedures have been submitted to the Board.

5.33 Permitted quantities

Except for the quantity reasonably needed for immediate use, or that is present for display or sale in public areas of a mercantile facility, the quantity of combustible and flammable liquids stored outside an approved storage cabinet, storage room or storage area in any fire compartment (2 hour fire separation) of a building must not exceed

(a) in closed containers, 600 litres (132 imp gal) of liquids having a flash point below 93.3°C (200°F) of which not more than 100 litres (22 imp gal) may be liquids having a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F), and

(b) in storage tanks or portable tanks, 5,000 litres (1,100 imp gal) of liquids having a flash point below 93.3°C (200°F) and a boiling point at or above 37.8°C (100°F).

5.34 Combustible materials

Except for packaging used to contain flammable or combustible liquids, combustible shelves, racks and other materials are not permitted inside a flammable or combustible liquids storage room or storage cabinet unless required as part of a fire separation.

5.35 Cabinet vent

If a flammable liquids storage cabinet is vented, the vent must be a steel pipe at least 5 cm (2 in) in diameter which is connected directly to the outdoors.

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5.36 Containers

(1) A tank, cylinder, bottle or other vessel containing a substance under pressure, together with any associated pressure or flow regulator and piping or conveyance system, must be

(a) protected from sparks, flames, excessive heat, physical damage, electrical contact or corrosion, and

(b) equipped with suitable pressure relief mechanisms installed so that no worker will be endangered in the event of discharge.

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

* See section 4.3 of the of the OHS Regulation.

(2) Hand-held aerosol spray cans are exempt from the requirements of subsection (1)(b).

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

5.37 Pressure testing

A compressed gas container which requires pressure testing must bear a valid and current indication that it has been pressure tested.

5.38 Handling and securing cylinders

(1) A compressed gas cylinder must not be hoisted by a sling or magnet, dropped, subjected to impact, handled by the regulator or used as a roller or work support.

(2) A compressed gas cylinder must be secured to prevent falling or rolling during storage, transportation and use, and where practicable, must be kept in the upright position.

5.39 Cylinder markings

A compressed gas cylinder must be marked to indicate its rated pressure and the type of gas it contains.

5.40 Cylinder valves

(1) The valve on a compressed gas cylinder must be kept closed when the cylinder is empty or not in use.

(2) A worker must not stand directly in front of a regulator attached to a compressed gas cylinder when

the cylinder valve is being opened.

(3) Any valve, regulator or fitting connected to a compressed gas cylinder must be a standard fitting, designed and manufactured for the type of cylinder and compressed gas for which it will be used, and must include provisions for flashback arresters where necessary.

(4) Unless a compressed gas cylinder is equipped with an integral valve guard, the valve cover must be in position when the cylinder is not connected for use.

5.41 Fittings

Only standard fittings designed for the specific compressed gas service may be used with a compressed gas system.

5.42 Regulator maintenance

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

* See section 4.3 of the of the OHS Regulation.

5.43 Empty cylinders

An empty compressed gas cylinder must be identified as being empty and must be stored separately from other compressed gas cylinders.

5.44 Acetylene cylinders

(1) A compressed gas cylinder containing acetylene must be used only in the upright position.

(2) If the cylinder has been stored or transported in a horizontal position, it must be placed in the upright position for at least 1 hour before it is used.

(3) A suitable device for closing the valve on an acetylene cylinder must be immediately available when the cylinder is connected for use.

5.45 Restriction on use of copper

A fitting or tube made of copper or any alloy containing more than 67% copper must not be used in a system carrying acetylene gas, except for copper torch tips and lengths of copper tubing 30 cm (1 ft) or less in length which are open to the atmosphere.

5.46 Restriction on use of oxygen

(1) Oxygen gas must not be used in any circumstance where it can contact a substance that oxidizes readily, such as a petroleum product, natural fibre or metal powder.

(2) Oxygen gas must not be used to

(a) operate a pneumatic tool,

(b) start an internal combustion engine,

(c) clean equipment or clothing,

(d) create pressure in a container, or

(e) ventilate a workplace.

5.47 Cleanliness

A worker must not permit oil or grease to contact an oxygen cylinder valve, regulator, or fitting.

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5.48 Exposure limits

Except as otherwise determined by the Board, the employer must ensure that no worker is exposed to a substance that exceeds the ceiling limit, short-term exposure limit, or 8-hour TWA limit prescribed by ACGIH.

[Enacted by B.C. Reg. 315/2003, effective October 29, 2003.]

* See also OHS Guideline G5.48-1.

5.49 Excursion limits

If a substance referred to under section 5.48 is provided only with an 8-hour TWA limit, the employer must, in addition to the requirement of section 5.48, ensure that a worker's exposure to the substance does not exceed

(a) three times the 8-hour TWA limit for more than a total of 30 minutes during the work period, and

(b) five times the 8-hour TWA limit at any time.

[Enacted by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

5.50 Extended work periods

(1) If the work period is more than 8 hours in a 24 hour day, the 8-hour TWA limit must be reduced by multiplying the TWA limit by the following factors:

Factor	Length of work period (in hours)
0.7	more than 8, but not more than 10
0.5	more than 10, but not more than 12
0.25	more than 12, but not more than 16
0.1	more than 16

(2) Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

5.51 Additive effects

If there is exposure to a mixture of 2 or more substances with established exposure limits which exhibit similar toxicological effects, the effects of such exposure must be considered additive unless it is known otherwise, and the additive exposure must not exceed 100% when calculated as follows:

$AE = \%EL_1 + \%EL_2 + ... \%EL_n$

where

(a) AE is the calculated additive exposure to the mixture,

(b) $\%EL_1$ is the measured exposure to component 1 of the mixture expressed as a percentage of its exposure limit,

(c) $\%EL_2$ is the measured exposure to component 2 of the mixture expressed as a percentage of its exposure limit, and

(d) $\%EL_n$ is the measured exposure to any additional components of the mixture expressed as a percentage of their respective exposure limits.

[Enacted by B.C. Reg. 315/2003, effective October 29, 2003.]

5.52 Skin designation

If skin absorption may contribute to the overall exposure, effective measures must be taken to limit exposure by this route.

Note: Substances which can contribute to exposure by skin absorption are identified with a "Skin"

notation by the ACGIH.

5.53 Workplace monitoring

(1) If a worker is or may be exposed to a hazardous substance, the employer must ensure that

(a) a walkthrough survey is conducted to assess the potential for overexposure taking into account all routes of exposure, including inhalation, ingestion, and skin contact, and

(b) reassessment is conducted when there is a change in work conditions which may increase the exposure, such as a change in production rate, process or equipment.

(2) If the walkthrough survey required by subsection (1) reveals that a worker may be at risk of overexposure to an airborne contaminant, the employer must ensure that air sampling is conducted to assess the potential for overexposure.

(3) Additional workplace monitoring to reliably determine worker exposure is required if

(a) the assessment under subsection (2) reveals that a worker may be exposed to an air contaminant in excess of 50% of its exposure limit, or

(b) measurement is not possible at 50% of the applicable exposure limit.

(4) Workplace exposure monitoring and assessment must be conducted using occupational hygiene methods acceptable to the Board.

(5) The results of workplace exposure monitoring and assessment, or a summary of the results, must be provided to workers at their request without undue delay.

Note: See also section 5.2 which provides general requirements to prevent overexposure by any route.

5.54 Exposure control plan

(1) An exposure control plan must be implemented when

(a) exposure monitoring under section 5.53(3) indicates that a worker is or may be exposed to an air contaminant in excess of 50% of its exposure limit,

(b) measurement is not possible at 50% of the applicable exposure limit, or

(c) otherwise required by this Regulation.

(2) The exposure control plan must incorporate the following elements:

(a) a statement of purpose and responsibilities;

(b) risk identification, assessment and control;

(c) education and training;

(d) written work procedures, when required;

(e) hygiene facilities and decontamination procedures, when required;

(f) health monitoring, when required;

(g) documentation, when required.

(3) The plan must be reviewed at least annually and updated as necessary by the employer, in consultation with the joint committee or the worker health and safety representative, as applicable.

5.55 Type of controls

(1) If there is a risk to a worker from exposure to a hazardous substance by any route of exposure, the employer must eliminate the exposure, or otherwise control it below harmful levels and below the applicable exposure limit established under section 5.48 by

(a) substitution,

(b) engineering control,

(c) administrative control, or

(d) personal protective equipment.

(2) When selecting a suitable substitute, the employer must ensure that the hazards of the substitute are known, and that the risk to workers is reduced by its use.

(3) The use of personal protective equipment as the primary means to control exposure is permitted only when

(a) substitution, or engineering or administrative controls are not practicable, or

(b) additional protection is required because engineering or administrative controls are insufficient to reduce exposure below the applicable exposure limits, or

(c) the exposure results from temporary or emergency conditions only.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

5.56 Oxygen deficiency

The airborne concentration of any gas or vapour must be controlled so that a worker is not exposed to an oxygen deficient atmosphere, and there is no other hazard, such as fire or explosion.

Note: Examples of gases that can cause an oxygen deficient atmosphere include:

acetylene	ethylene	methane	propane
argon	helium	neon	propylene
ethane	hydrogen	nitrogen	

5.57 Designated substances

(1) If a substance identified as any of the following is present in the workplace, the employer must replace it, if practicable, with a material which reduces the risk to workers:

(a) ACGIH A1 or A2, or IARC 1, 2A or 2B carcinogen;

(b) ACGIH reproductive toxin;

(c) ACGIH sensitizer;

(d) ACGIH L endnote.

(2) If it is not practicable to substitute a material which reduces the risk to workers, in accordance with subsection (1), the employer must implement an exposure control plan to maintain workers' exposure as low as reasonably achievable below the exposure limit established under section 5.48.

(3) The exposure control plan must meet the requirements of section 5.54.

[Enacted by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

5.58 Protective policy

(1) At any worksite where a worker is exposed to a substance which is identified in section 5.57(1) as an ACGIH reproductive toxin or an ACGIH sensitizer, the employer must develop policy and procedures appropriate to the risk, which may include protective reassignment.

(2) The policy and procedures required by subsection (1) must

(a) inform workers about the reproductive toxin and identify ways to minimize exposure to the toxin for a worker who has advised the employer of pregnancy or intent to conceive a child, and

(b) identify ways to eliminate or minimize exposure to a sensitizer for a worker who is or may be sensitized to that substance.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

5.59 Investigating symptoms

(1) If a worker exhibits signs or reports symptoms of overexposure to a hazardous substance present in the workplace, the employer must investigate and assess the potential for exposure.

(2) If the assessment demonstrates that the signs or symptoms can be caused by exposure to a hazardous substance that is present in the workplace, further investigation must be conducted, in consultation with the joint committee or the worker health and safety representative, as applicable, to address and resolve the worker's concern.

(3) Records of the investigation required under subsection (2) must be made available to workers, and maintained by the employer for a minimum of 10 years.

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5.60 Application

Sections 5.61 to 5.71 apply to ventilation used for the control of air contaminants in the workplace, except for heating, ventilation and air conditioning (HVAC) systems in buildings, which are subject to requirements on indoor air quality in Part 4 (General Conditions).

5.61 Engineering principles

A ventilation system for controlling airborne contaminants in the workplace must be designed, installed and maintained using established engineering principles.

Note: A useful guide is *Industrial Ventilation — A Manual of Recommended Practice* published by the American Conference of Governmental Industrial Hygienists.

5.62 Submitting plans

The employer or the employer's agent must submit to the Board drawings and specifications for an existing or proposed ventilation system if requested by the Board.

5.63 Building modifications

The owner of a building must permit an employer to install an exhaust ventilation and makeup air system to meet the requirements of this Part for controlling harmful air contaminants in the workplace, provided that all such work is subject to the approval of the owner acting reasonably.

5.64 Controlling air contaminants

(1) If ventilation is used as an engineering control, an air contaminant must be controlled at the source by an effective local exhaust ventilation system.

(2) If local exhaust ventilation is not practicable, general (dilution) ventilation, or a combination of general and local exhaust ventilation must be used.

5.65 Worker location

A local exhaust ventilation system must be designed so that under normal work procedures a worker's

breathing zone is not located between the source of contamination and the exhaust uptake.

5.66 Ventilation openings

A ventilation system must not be obstructed by material or equipment placed in front of the ventilation openings.

5.67 Effectiveness

(1) An exhaust ventilation system used to control air contaminants in the workplace must remain in operation until the work process is completed and the air contaminants generated have been removed so as not to be a hazard to workers.

(2) An exhaust ventilation system used to control air contaminants in the workplace must be regularly inspected and monitored to ensure that it remains effective.

5.68 Failure warning

If failure of an exhaust ventilation system would result in a hazard that is not readily apparent to affected workers, the system must be equipped with a device or other means to warn those workers in the event of system failure.

5.69 Makeup air

(1) An adequate supply of makeup air must be provided as necessary to

(a) maintain the effectiveness of an exhaust ventilation system, or

(b) prevent an air contaminant being drawn into the work space from another work area.

(2) A makeup air supply must not expose a worker to uncomfortable temperatures or drafts.

5.70 Discharged air

(1) The use of a ventilation system designed to recirculate contaminants into the work area is restricted by the provisions of Table 5-1.

(2) A ventilation system that discharges air from the work area must be designed to minimize the likelihood of exposing any worker at a workplace, including an adjacent workplace,

(a) to an air contaminant in a concentration which exceeds either 10% of its applicable exposure limit in this Part or an acceptable ambient air quality standard established by an authority having jurisdiction over environmental air standards, whichever is greater, and

(b) if practicable, to an objectionable odour.

Note: Contaminated exhaust discharged to the outdoor air is subject to the applicable federal, provincial and municipal requirements.

Table 5-1: Recirculation of discharged air

Recirculation permitted without written approval	A nuisance particulate with an 8-hour TWA limit of at least 10 mg/m^3, provided that its concentration in the discharged air is less than 10% of the TWA limit. Asbestos fibre or other particulate, except a biological contaminant, provided that it is exhausted from a portable vacuum cleaner or bench-top containment unit, fitted with an effective HEPA filter. A welding fume (including its components identified under section 5.57(1)) exhausted from a portable welding fume extractor fitted with an air cleaner, provided that its concentration in the discharged air is less than 10% of the applicable exposure limit. A biological contaminant discharged from a biological safety cabinet that is installed and operated in accordance with the requirements in Part 30 (Laboratories). Non-allergenic softwood dust, provided that its concentration in the discharged air is less than 10% of the 8-hour TWA limit.
Recirculation only with written approval by the Board	Allergenic wood dust. Non-allergenic hardwood dust. Any contaminant not otherwise listed in this Table.
No recirculation permitted	A substance identified under section 5.57(1), unless otherwise identified in this Table.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

5.71 Flammable air contaminants

(1) If an operation or work process produces a combustible or flammable air contaminant in concentrations that may present a risk of fire or explosion, the employer must provide a separate exhaust ventilation system for the operation or work process.

(2) Electrical components of an exhaust ventilation system required by subsection (1) must comply with Class I Division I requirements of *CSA Standard C22.1-94, Canadian Electrical Code, Part 1* if the components contact the air stream.

(3) A dust collector having an internal volume greater than 0.6 m^3 (20 ft^3) and being used to control combustible dusts must be located and constructed so that no worker will be endangered in the event of

an explosion inside the collector.

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

* See also section 4.4 of the OHS Regulation.

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5.72 Venting outdoors

Whenever possible, exhaust from any internal combustion engine operated indoors must be vented to the outdoors.

5.73 Indoor operation

If mobile equipment powered by an internal combustion engine is operated indoors or in an enclosed work area

(a) the engine must be adequately serviced and maintained to minimize the concentration of air contaminants in the exhaust, and

(b) the work area must be assessed to determine the potential for exposure of workers to harmful levels of exhaust components.

5.74 Emission controls

If a worker is or may be exposed to an exhaust gas component in concentrations exceeding the applicable exposure limits, exhaust gas scrubbers, catalytic converters, or other engineering controls must be installed.

5.75 Mobile equipment emission controls

Mobile equipment manufactured after January 1, 1999 that is regularly operated indoors must be

(a) equipped with an emission control system that includes a feedback control for air/fuel ratio, and a three-way catalytic converter if the mobile equipment is powered by gasoline, propane or natural gas, or other measures acceptable to the Board, or

(b) equipped with a scrubber or other emission control system that reduces particulate emissions by at least 70% when tested according to the procedures of the Mine Safety and Health Administration, US Department of Labour, or must meet another standard acceptable to the Board, if the mobile equipment is powered by diesel fuel.

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

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5.76 Label

If an employer produces, stores, handles or disposes of a hazardous waste at a workplace, the employer must, except as provided in section 5.79, ensure that a workplace label is applied to each container of hazardous waste, or the information mandated by the Hazardous Products Regulations is provided, if applicable.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.77 Placard

(1) An employer may identify a hazardous waste which is not in a container by posting a placard in a workplace which

(a) discloses the information required for a workplace label, and

(b) is of a size and in locations so that the information is conspicuous and clearly legible to workers.

(2) If a fugitive emission that contains a hazardous product is produced or disposed of, the employer must post a placard which complies with subsection (1), or ensure equivalent information is provided to workers through identification and training.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.78 SDS

If a hazardous waste or a fugitive emission that contains a hazardous product is produced, stored, handled or disposed of in the workplace, the employer must prepare an SDS for the hazardous waste or fugitive emission unless a hazardous waste profile sheet or its equivalent which addresses composition, hazards and safe measures for the waste or fugitive emission is readily available.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.79 Sale or disposal

An employer must not sell or dispose of a hazardous waste intended for use, handling, storage or disposal in a workplace unless

(a) the hazardous waste or container in which the waste is packaged has a label or placard which complies with sections 5.76 and 5.77, and

(b) at the time of sale or disposal the employer transmits to the receiver an SDS for the hazardous products in the hazardous waste or a hazardous waste profile sheet which addresses the composition, hazards and safe measures for the hazardous waste.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.80 Sharp-edged waste

Broken glass, metal or similar rigid, sharp-edged waste must be disposed of in separate, puncture proof waste containers and the contents of the containers must be clearly identified.

5.81 Combustible dust

If combustible dust collects in a building or structure or on machinery or equipment, it must be safely removed before accumulation of the dust could cause a fire or explosion.

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5.82 Employer's responsibility

(1) If a work process may result in harm to a worker from contamination of the worker's skin or clothing by a hazardous substance, the employer must

(a) supply appropriate protective clothing,

(b) launder or dispose of the protective clothing on a regular basis, according to the hazard,

(c) provide adequate wash facilities, and

(d) allow time for washing before each work break.

(2) If work processes involving substances such as lead, mercury, asbestos, silica or pesticides are high hazard, the employer must also ensure that workers are provided with

(a) clothing lockers in separate rooms for street clothing and work clothing,

(b) heated shower facilities between the rooms, and

(c) time for showering and clothing change before the end of the work shift.

(3) In a remote location where provision of change rooms and shower facilities is not practicable, separate clothing storage and adequate washing facilities must be provided.

5.83 Worker's responsibility

A worker engaged in a work process described in section 5.82 must

(a) wear the supplied protective clothing,

(b) wash effectively before each work break and the end of the work shift, and

(c) shower at the end of the work shift, if required by the hazard.

5.84 Prohibition

Eating, drinking, smoking, applying cosmetics or storing food is prohibited in any work area where a work process described in section 5.82 takes place.

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5.85 Where required

The employer must ensure that appropriate emergency washing facilities are provided within a work area where a worker's eyes or skin may be exposed to harmful or corrosive materials or other materials which may burn or irritate.

5.86 Water supply

(1) For a plumbed emergency eyewash facility, the employer must ensure that only a potable water supply is used.

(2) For a portable (non-plumbed) eyewash unit, the employer must ensure that only potable water or an isotonic saline flushing solution is used.

5.87 Access

The employer must ensure that access to emergency eyewash and shower facilities is not blocked by material or equipment.

5.88 Risk assessment

The employer must ensure that the selection of emergency washing facilities is based upon an assessment of the risks present in the workplace, according to Table 5-2.

5.89 Equipment required

(1) The employer must ensure, except where it is not practicable to provide a permanent water supply, such as at a remote or transient worksite, that emergency eyewash and shower facilities are provided and located as specified in Table 5-3.

(2) Requirements for tempered water in Table 5-3 do not apply if the advice of a medical professional indicates that tempered washing would increase the risk of injury in a particular application.

5.90 Transient worksites

(1) The employer must ensure that portable self-contained units are provided, where it is not practicable to provide a permanent water supply at transient worksites such as construction sites.

(2) The employer must ensure that portable self-contained units at these transient worksites are capable of delivering a minimum flush duration of 15 minutes (or more if required by the nature of the material) if there is a high or a moderate risk of injury to the eyes or skin.

5.91 Remote worksites

The employer must ensure that effective means to flush the eyes or skin, based upon an assessment of the risk, is reasonably available at a remote worksite if it is not practicable to provide a portable self-contained unit.

5.92 Signs

The employer must ensure that emergency eyewash and shower facilities are clearly identified by signs which indicate their location and provide clear directions for their use.

5.93 Testing

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

(2) The employer must ensure that a plumbed emergency eyewash or shower facility is full flow tested at least once per month, for a sufficient length of time to completely flush the branch of the water line supplying the eyewash.

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

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

* See section 4.3 of the OHS Regulation.

5.94 Training

The employer must ensure that workers who are required to use emergency eyewash and shower facilities are adequately trained in their location and proper use.

5.95 Protection from freezing

The employer must ensure that an emergency eyewash or shower facility and the piping from the supply are protected against freezing.

Table 5-2: Risk assessment

Risk level	Description of the workplace	Examples
High risk	Workplaces at which corrosive chemicals or other materials are used in a manner, concentration and quantity which present a risk of irreversible tissue damage to the eyes or skin, or of serious illness resulting from rapid absorption of a toxic substance through the eyes or skin, or where the work activity presents a risk of ignition of the clothing.	Maintenance of ammonia refrigeration equipment or chlorine bleaching or disinfection equipment, handling corrosive materials such as corrosive cleaning products or chemical reagents where there is a high risk of skin or eye contact, filling chemical storage batteries. The following Health Hazard Classes and Categories in the HPR are included: (a) skin corrosion (1A), (1B), (1C); (b) serious eye damage (1).
Moderate risk	Workplaces at which chemicals or other materials are used in a manner, concentration and quantity which present a risk of irritation or other reversible harm to the eyes or skin, or of illness resulting from absorption of a toxic substance through the eyes or skin.	Spraying automotive paints and finishes, operating solvent degreasing equipment, handling irritant materials such as cleaning products or chemical reagents where there is a moderate risk of skin or eye contact, handling dry-cleaning solvents and spotting agents. The following Health Hazard Classes and Categories in the HPR are included: (a) eye irritation (2A), (2B); (b) skin irritation (2).
Low risk	Workplaces at which chemicals or other materials are used in a manner and quantity which present a risk of mild eye or skin irritation.	Using detergents, silicone-based mold-release agents, some hair-dressing solutions, rosin-cored solders, welding and grinding, working in dusty areas.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

Table 5-3: Provision and location of emergency washing equipment

	High risk	**Moderate risk**	Low risk
Eye Equipment	Tempered, continuous flow eyewash facility with a minimum duration of 15 minutes (or more if required by the nature of the material).	Tempered, continuous flow eyewash facility with a minimum duration of 15 minutes.	Effective means to flush the eyes.
Location	Within 5 seconds walking distance of the hazard area, but no further than 6 m (20 ft). For high risk corrosive gases such as ammonia or chlorine, the facilities must not be located in the gas storage or use area, but rather, adjacent to it.	Within 10 seconds walking distance of the hazard area, but no further than 30 m (100 ft). May be located further than 30 m, provided that (a) a supplementary eyewash facility such as a personal eyewash unit or a non-tempered drench hose is located within 10 seconds walking distance of the hazard area but no further than 30 m, and (b) first aid services are maintained to start treatment of an affected worker within 5 minutes of the contact.	Within 10 seconds walking distance of the hazard area but no further than 30 m (100 ft).
Skin Equipment	Tempered, continuous flow emergency shower facility with a minimum duration of 15 minutes (or more if required by the nature of the material).	Tempered, continuous flow emergency shower facility with a minimum duration of 15 minutes.	Emergency flushing equipment, such as a non-tempered drench hose.
Location	Same location criteria as for high risk eyewash facility except that the shower may be located further than 6 m if (a) a supplementary emergency washing facility such as a non-tempered drench hose is located within 5 seconds walking distance of the hazard area but no further than 6 m, and	Same location criteria as for moderate risk eyewash facility except that the supplementary emergency washing facility for locations beyond 30m must be a unit such as non-tempered drench hose.	Same location criteria as for low risk eyewash facility.

	(b) a tempered shower facility is available within the building to start emergency washing within 5 minutes of the contact.		

5.96 Valve operation

The employer must ensure that a valve which activates an emergency eyewash or shower facility is designed so that, once activated, the flow of water or flushing solution will continue without requiring the use of the operator's hands.

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5.97 Emergency plan

(1) A workplace must have a written emergency plan, appropriate to the hazards of the workplace, that addresses the requirements of sections 5.98 to 5.102.

(2) The plan must address emergency conditions which may arise from within the workplace and from adjacent workplaces.

(3) The plan must be developed, implemented and annually reviewed in consultation with the joint committee or the worker health and safety representative, as applicable.

5.98 Inventory

(1) An inventory must be maintained which identifies all hazardous substances at the workplace in quantities that may endanger workers in an emergency including hazardous products covered by WHMIS, explosives, pesticides, radioactive materials, hazardous wastes, and consumer products.

(2) The inventory must identify the nature, location, and approximate quantity of all such substances, and the location of SDSs.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

5.99 Risk assessment

An employer must ensure that an assessment is conducted of the risks posed by hazardous substances from accidental release, fire or other such emergency.

5.100 Procedures for evacuation

(1) Written evacuation procedures appropriate to the risk must be developed and implemented to

(a) notify workers, including the first aid attendant, of the nature and location of the emergency,

(b) evacuate workers safely,

(c) check and confirm the safe evacuation of all workers,

(d) notify the fire department or other emergency responders, and

(e) notify adjacent workplaces or residences which may be affected if the risk of exposure to a substance extends beyond the workplace.

(2) Notification of the public must be in conformity with the requirements of other jurisdictions, including provincial and municipal agencies.

5.101 Procedures for spill cleanup and re-entry

If workers are required to control a release of a hazardous substance, to perform cleanup of a spill, or to carry out testing before re-entry, the employer must provide

(a) adequate written safe work procedures,

(b) appropriate personal protective equipment which is readily available to workers and is adequately maintained, and

(c) material or equipment necessary for the control and disposal of the hazardous substance.

Note: Other jurisdictions and agencies may require notification in the event of a spill.

5.102 Training and drills

The employer must

(a) provide training in the appropriate emergency procedures to all workers who may be affected, and

(b) conduct drills to test the adequacy of procedures and to ensure that workers and supervisors are familiar with their roles and responsibilities.

TABLE 5-4: EXPOSURE LIMITS AND DESIGNATIONS [Repealed by B.C. Reg. 315/2003, effective October 29, 2003.]

* See OHS Guideline G5.48-1.

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6.1 Definitions

In this section and sections 6.2 to 6.32:

"asbestos-containing material" means the following:

(a) a manufactured article or other material, other than vermiculite insulation, that would be determined to contain at least 0.5% asbestos if tested in accordance with one of the following methods:

(i) Asbestos, Chrysotile by XRD, Method 9000 (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

(ii) Asbestos (bulk) by PLM, Method 9002 (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

(iii) Test Method for the Determination of Asbestos in Bulk Building Materials (EPA/600/R-93/116, dated July 1993) published by the United States Environmental Protection Agency;

(b) vermiculite insulation that would be determined to contain any asbestos if tested in accordance with the Research Method for Sampling and Analysis of Fibrous Amphibole in Vermiculite Attic Insulation (EPA/600/R-04/004, dated January 2004) published by the United States Environmental Protection Agency;

"clean room" means a room in a high risk decontamination facility which is used by workers to change from street clothes into protective work clothing and equipment prior to entering the designated work area;

"clearance air sampling" means sampling to determine if the air inside a containment of a high risk work activity is sufficiently free of asbestos fibre to permit the dismantling of the containment;

"containment" means an isolation system designed to effectively contain asbestos fibre within a

designated work area where asbestos-containing material is handled, removed, encapsulated or enclosed, and includes a glove bag;

"decontamination facility" means a series of rooms constructed so as to allow a person to enter and leave a containment without spreading asbestos fibre or waste material beyond the designated work area;

"designated work area" means an area for work with asbestos-containing material which is restricted to access by authorized persons by warning signs and by barricades, enclosures or other means of isolation, with due regard for the level of risk;

"encapsulation" means treatment of an asbestos-containing material or surface with a sealant which penetrates the material and binds the fibres together;

"enclosure" means isolation of asbestos-containing material from adjacent occupied areas in a building by physical barriers such as gyproc, plywood, or metal sheeting, to prevent the release of airborne asbestos fibres into these areas;

"friable asbestos-containing material" means asbestos-containing material that is crumbled or powdered or can be crumbled or powdered by hand pressure;

"high risk work activity" means a work activity that involves working with or in proximity to asbestos-containing material if a high level of control is necessary in respect of that activity to prevent exposure of a worker to airborne asbestos fibre;

"low risk work activity" means a work activity that involves working with or in proximity to asbestos-containing material if, at the time the work activity is being carried out, both of the following apply:

(a) the asbestos-containing material is not being

(i) cut, sanded, drilled, broken, ground down or otherwise fragmented, or

(ii) disturbed such that the asbestos-containing material may release airborne asbestos fibre;

(b) it is not necessary to use personal protective equipment or engineering controls in respect of that activity to prevent exposure of a worker to airborne asbestos fibre;

"moderate risk work activity" means a work activity, other than a high risk work activity, that involves working with or in proximity to asbestos-containing material if, at the time the work activity is being carried out, one or both of the following apply:

(a) the asbestos-containing material is being

(i) cut, sanded, drilled, broken, ground down or otherwise fragmented, or

(ii) disturbed such that the asbestos-containing material may release airborne asbestos fibre;

(b) it is necessary to use personal protective equipment or engineering controls, or both, in respect of that activity to prevent exposure of a worker to airborne asbestos fibre;

"qualified person" means a person who

(a) has knowledge of the management and control of asbestos hazards through education and training,

and

(b) has experience in the management and control of asbestos hazards.

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

[Amended by B.C. Reg. 19/2006, effective May 17, 2006.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.2 Application

Sections 6.3 to 6.32 apply to a workplace where a worker is or may be exposed to potentially harmful levels of asbestos fibre, including a workplace where asbestos-containing material is present.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

General Requirements

6.3 Exposure control plan

(1) If a worker is or may be exposed to potentially harmful levels of asbestos, the employer must develop and implement an exposure control plan meeting the requirements of section 5.54.

(2) To ensure adequate coordination of the overall plan, the employer must ensure that it is administered by a properly trained person.

6.4 Inventory

(1) The employer must ensure that a qualified person

(a) collects representative samples of the materials in the workplace that the qualified person suspects contain asbestos, and

(b) determines whether each of the samples is asbestos-containing material in accordance with,

(i) in the case of a sample that is not vermiculite insulation, one of the methods set out in paragraph (a) (i) to (iii) of the definition of "asbestos-containing material" in section 6.1, and

(ii) in the case of a sample that is vermiculite insulation, the method set out in paragraph (b) of the definition of "asbestos-containing material" in section 6.1.

(2) If a qualified person suspects that an inaccessible material contains asbestos, the material must be treated as asbestos-containing material unless a qualified person determines, in accordance with subsection (1) (b), that it is not asbestos-containing material.

(3) The employer must

(a) ensure that a qualified person prepares an inventory of all asbestos-containing materials in the workplace,

(b) keep the inventory at the workplace, and

(c) keep the inventory current.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

6.5 Identification

The employer must ensure that all asbestos-containing materials present in the workplace are identified by signs, labels or when these are not practicable, other effective means.

6.6 Assessment and classification

(1) The employer must ensure that a risk assessment is conducted by a qualified person on asbestos-containing material identified in the inventory referred to in section 6.4 (3), with due regard for the condition of the material, its friability, accessibility and likelihood of damage, and the potential for fibre release and exposure of workers.

(2) The employer must ensure that a risk assessment has been conducted by a qualified person before any demolition, alteration, or repair of machinery, equipment, or structures where asbestos-containing material may be disturbed.

(3) Before a work activity that involves working with or in proximity to asbestos-containing material begins, the employer must ensure that a qualified person assesses the work activity and classifies it as a low risk work activity, a moderate risk work activity or a high risk work activity.

(4) Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.7 Control of asbestos fibre

(1) The employer must ensure that all friable asbestos-containing materials in the workplace are controlled by removal, enclosure or encapsulation so as to prevent the release of airborne asbestos fibre.

(2) The employer must not allow any work that would disturb asbestos-containing material unless necessary precautions have been taken to protect workers.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.8 Procedures

(1) The employer must ensure that procedures for handling or using asbestos-containing material prevent or minimize the release of airborne asbestos fibres.

(2) The employer must ensure that the procedures for control, handling or use of asbestos are in accordance with procedures acceptable to the Board.

(3) The procedures must address

(a) containment of asbestos operations where applicable,

(b) control of the release of asbestos fibre,

(c) provision, use and maintenance of appropriate personal protective equipment and clothing,

(d) means for the decontamination of workers, and

(e) removal of asbestos waste and cleanup of asbestos waste material.

(4) The procedures must provide a worker with task-specific work direction that addresses both hazards and necessary controls.

6.9 Prohibitions

(1) Except for waste intended for disposal, the employer must ensure crocidolite asbestos or material containing crocidolite asbestos is not brought into or used in a workplace.

(2) The spraying of asbestos or asbestos-containing material is not permitted.

(3) Pressure spraying equipment of any type must not be used to remove asbestos insulation or other asbestos-containing material from buildings or structures.

(4) The employer must not permit the use of compressed air to clean up or remove asbestos dust or debris, or dry sweeping or dry mopping of asbestos waste.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.10 Substitution

(1) The employer must substitute material less hazardous than asbestos-containing material when practicable.

(2) If such substitution is not practicable, the employer must document the reasons why less hazardous material cannot be substituted for asbestos-containing material, and make this documentation available to workers and to the joint committee or the worker health and safety representative, as applicable.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.11 Instruction and training

The employer must ensure that a worker who is at risk of exposure to asbestos is adequately instructed and trained in

(a) the hazards of asbestos,

(b) the means of identifying asbestos-containing material at the worksite,

(c) the work procedures to be followed,

(d) the correct use of the required personal protective equipment, and operation of the required

engineering controls, and

(e) the purpose and significance of any required health monitoring.

6.12 Monitoring

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

(2) During a high risk work activity, except where glove bags are used as the containment, the employer must sample for airborne asbestos fibre in

(a) areas outside of the containment but in its vicinity, at least daily if there are unprotected workers in the area,

(b) the clean room, at least daily during removal and cleanup operations, and

(c) contaminated areas inside the containment, as necessary during removal and cleanup to ensure that workers are adequately protected.

(3) The employer must make the results of all air samples taken during a high risk work activity available to the workers involved, within 24 hours of completing the collection of the samples

(4) Except where glove bags are used as the containment, prior to dismantling a containment used in a high risk work activity and after all asbestos waste has been cleaned up, removed or otherwise controlled, the employer must ensure that

(a) clearance air sampling is conducted in previously contaminated areas inside the containment, and

(b) the airborne asbestos fibre levels in these areas do not exceed 0.02 f/ml.

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

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

Designated Work Areas and Containments

6.13 Designated area

(1) Before starting work with asbestos-containing material, the employer must, with due regard for the level of risk,

(a) identify and mark the boundary of the designated work area by barricades, fences, or similar means,

(b) ensure that the immediate work area is cleared of objects, materials and equipment other than that required to do the work, and

(c) ensure that windows, doorways and all other openings are adequately secured to prevent the release of asbestos fibre into other work areas.

(2) The employer must post signs at the boundaries of the designated work area indicating asbestos work is in progress, the hazards, and the precautions required for entering the work area.

(3) The employer must restrict entry into the designated work area to authorized persons who are adequately protected against the level of risk within the designated work area.

6.14 Permanent enclosure design

When asbestos-containing material in the workplace is controlled by a permanent enclosure, the employer must ensure that the enclosure is airtight, and if practicable, that electrical, plumbing, ventilation and similar services are located outside the enclosure.

6.15 Glove bags

The employer must ensure that when a prefabricated glove bag is used for the removal of asbestos insulation from pipes, ducts and similar structures

(a) the glove bag is sealed to prevent the release of asbestos fibres into the work area outside the bag,

(b) waste materials on surfaces are washed to the bottom of the glove bag and all exposed asbestos insulation is encapsulated while inside the glove bag enclosure,

(c) all glove bags are evacuated through a HEPA vacuum to remove the air inside the bag, prior to removal of the bag, and

(d) after removing the glove bag, all exposed surfaces are cleaned again.

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

6.16 High risk work

(1) For high risk work activity the employer must provide and maintain a containment and a decontamination facility, except that a decontamination facility is not required if the containment is a glove bag.

(2) The employer must inspect a containment and a decontamination facility used for high risk work activity at least daily to ensure their effectiveness is maintained.

(3) The employer must ensure that the design of the decontamination facility includes

(a) a physical connection to the containment,

(b) a shower facility, and

(c) provision for the safe entry and exit of workers.

(4) If the high risk work activity involves encapsulation of asbestos-containing material, the employer must ensure that the encapsulant penetrates the material and effectively binds the asbestos fibres together, and has not disturbed the bonding of the material to the supporting surface.

(5) At the completion of a high risk work activity and before dismantling the containment, the employer must

(a) visually inspect the area inside the containment to ensure that an effective cleanup has been

completed, and

(b) treat all exposed surfaces inside the containment with a sealant to bind any remaining asbestos fibres and prevent them from becoming airborne.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

Ventilation

6.17 Containment ventilation

The employer must, with the exception of a glove bag, ventilate a containment to ensure that

(a) air flows only from clean outside areas into the contaminated area,

(b) exhaust air from the containment ventilation system is directed to the outdoors through an effective HEPA filter, and

(c) there is an inward airflow through the decontamination facility into the containment.

6.18 Local exhaust ventilation

The employer must provide local exhaust ventilation with exhaust air discharged through a HEPA filter for all dust-producing operations outside a containment where asbestos-containing material is handled or used.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.19 Filter testing

(1) The employer must assess the effectiveness of HEPA filters by DOP (dioctyl phthalate) testing or similar means at least annually, after a HEPA filter is replaced in a vacuum cleaner or ventilation system, and before use in high risk work activity.

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

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

Other Means of Controlling Exposure to Asbestos

6.20 Protecting work surfaces

(1) Before starting work where exposed friable asbestos-containing material is present or asbestos-containing material has been handled, the employer must remove all asbestos dust from contaminated work surfaces with a damp cloth or similar material, or with a vacuum cleaner equipped with a HEPA-filtered exhaust.

(2) Work surfaces in the work area must be kept as free as practicable from accumulations of asbestos dust.

(3) Work surfaces in a designated work area must, with due regard for the level of risk, be covered with plastic sheets, tarpaulins or similar materials to help control the spread of asbestos-containing material.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.21 Preventing spread

The employer must prevent the spread of asbestos dust and debris to other work areas during the work.

6.22 Wetting material

Asbestos-containing material that is to be removed or disturbed must be effectively wetted before and during the work, whenever practicable.

6.23 Repairing damaged material

When damaged asbestos-containing material is repaired, the employer must ensure that

(a) the repair methods will seal all exposed, friable ends or edges, and

(b) the methods used disturb the least amount of asbestos-containing material necessary to complete the repair.

6.24 Friction materials

If automotive service procedures may involve friction material that is asbestos-containing material or dust arising from such material, the employer must ensure that the following control measures are implemented:

(a) dry removal of friction material dust from automotive assemblies using compressed air, brushes, or other similar means is prohibited;

(b) service work areas where friction material is handled are posted with signs to advise workers of the hazards and required precautions;

(c) suitable work procedures are followed to minimize the generation of airborne dust;

(d) a worker handling equipment or assemblies contaminated with dust from friction material, outside of a HEPA-filtered vacuum enclosure system, wears suitable personal protective equipment, including disposable coveralls and at least a HEPA-filtered dual cartridge half face respirator;

(e) waste material that may be contaminated with asbestos is promptly collected and disposed of in accordance with applicable requirements;

(f) contaminated tools, equipment and work surfaces are cleaned after work is completed.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

Waste Handling and Disposal

6.25 Sealed containers

The employer must ensure that all asbestos waste and other waste contaminated with asbestos, including disposable protective clothing and cleanup equipment, is placed into sealed containers which are labelled as containing asbestos.

6.26 Cleaning containers and equipment

(1) The employer must ensure that the exterior of a container of asbestos waste is cleaned with a damp cloth or a vacuum cleaner equipped with a HEPA-filtered exhaust before being removed from a designated work area.

(2) Reusable tools and equipment contaminated with asbestos must be cleaned after work is completed.

6.27 Waste removal

(1) Before any work involving asbestos takes place, the employer must ensure that procedures for the safe removal of asbestos dust and debris from the work area are set out in writing by a qualified person.

(2) The written procedures must

(a) comply with the requirements set out in section 6.8,

(b) provide for removal of asbestos dust and debris from the work area

(i) while work is in progress, at intervals necessary to eliminate or minimize the risk of exposure,

(ii) at the end of each work shift, and

(iii) at the completion of work involving asbestos, and

(c) consider the nature of the asbestos dust and debris to be removed and provide specific direction regarding which of the following removal methods, or combination of the following removal methods, is most appropriate for safe removal of that asbestos dust and debris in relation to each of the times set out in paragraph (b) (i), (ii) and (iii):

(i) using a vacuum cleaner, or similar device, that is equipped with a HEPA-filtered exhaust;

(ii) wiping surfaces with a damp cloth or sponge to remove residual amounts of asbestos dust and debris;

(iii) wet sweeping or wet mopping to remove larger amounts of asbestos dust and debris;

(iv) using a shovel or similar device to place larger amounts of dampened asbestos debris into the sealed container required by section 6.25;

(v) using another method that is acceptable to the Board.

(3) The employer must ensure that

(a) every worker who is engaged in asbestos dust and debris removal at the work area is adequately instructed and trained in the written procedures of the qualified person under this section, and

(b) the written procedures of the qualified person are followed.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

6.28 Waste disposal

The employer must dispose of containers of asbestos waste promptly to prevent the accumulation of large amounts of asbestos waste.

Personal Protective Clothing and Equipment

6.29 Respiratory protection

(1) The employer must supply, and ensure that workers within a designated work area wear, respirators which are adequate for the anticipated level of exposure.

(2) The employer must ensure that a single use respirator is not used for protection against asbestos.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

6.30 Protective clothing

(1) The employer must ensure that all persons within a designated work area wear protective clothing which is made of material resistant to penetration by asbestos fibres, fits snugly at the neck, wrists and ankles, and as necessary to protect against the risk, covers the head and feet as well as the body.

(2) The employer must replace or repair any torn or damaged protective clothing immediately.

(3) Before a worker removes protective clothing and equipment, the employer must ensure that the worker cleans this gear with a damp cloth or a vacuum cleaner equipped with a HEPA-filtered exhaust.

(4) The employer must ensure that a worker removes protective clothing and equipment before leaving the designated work area.

(5) The employer must ensure that protective clothing contaminated with asbestos is, before reuse, cleaned with a vacuum cleaner equipped with a HEPA-filtered exhaust, and placed in a water-soluble plastic bag, which is sealed and labelled before being sent to an acceptable laundry facility.

6.31 Information to laundry workers

The employer must ensure that workers who launder clothing contaminated with asbestos are informed of the hazards of asbestos and the precautions required for handling the clothing.

Documentation

6.32 Types of records

(1) The employer must maintain for at least 10 years, records of asbestos-containing materials inventories and risk assessments, inspections and air monitoring results.

(2) The employer must maintain for at least 3 years, records of corrective actions to control asbestos fibre release, training and instruction of workers, written work procedures and written notification of the Board.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

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6.33 Definitions

In sections 6.33 to 6.40:

"medical sharp" means a needle device, scalpel, lancet or any other medical device that can reasonably be expected to make parenteral contact;

"occupational exposure" means reasonably anticipated contact with a biological agent, that is designated as a hazardous substance in section 5.1.1, resulting from the performance of a worker's duties;

"parenteral contact" means piercing of mucous membranes or the skin;

"precautionary principle" means adopting provisional precautions covering all routes of transmission, based on a higher level of protection, when the identity, aetiology or routes of transmission of the biological agent designated as a hazardous substance in section 5.1.1 have not been established;

"route of transmission" means any route by which a biological agent designated as a hazardous substance in section 5.1.1 may be transmitted including contact, droplet or airborne transmission;

"safety-engineered medical sharp" means a medical sharp with a built-in safety feature or mechanism that eliminates or minimizes the risk of accidental parenteral contact while or after the sharp is used;

"safety-engineered needle" includes a self-sheathing needle device and a retractable needle system.

"standard or routine infection control precautions" means safe work practices as defined by the *Practical Guidelines for Infection Control in Health Care Facilities* issued by the World Health Organization, as amended from time to time, and the *Infectious Diseases, Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care* guidelines issued by Health Canada, as amended from time to time;

"transmission-based precautions" means safe work practices based on the route of transmission as defined by the *Practical Guidelines for Infection Control in Health Care Facilities* issued by the World Health Organization, as amended from time to time, and the *Infectious Diseases, Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care* guidelines issued by Health Canada, as amended from time to time.

[Amended by B.C. Reg. 241/2006, effective January 1, 2007.]

[Amended by B.C. Reg. 106/2007, effective July 26, 2007.]

[Amended by B.C. Reg. 319/2007, effective February 1, 2008.]

6.34 Exposure control plan

(1) If a worker has or may have occupational exposure, the employer must develop and implement an exposure control plan, based on the precautionary principle, that meets the requirements of section 5.54 and that includes the following:

(a) a risk assessment conducted by a qualified person to determine if there is a potential for occupational exposure by any route of transmission;

(b) a list of all work activities for which there is a potential for occupational exposure;

(c) engineering controls and administrative controls to eliminate or minimize the potential for occupational exposure;

(d) standard or routine infection control precautions and transmission-based precautions for all work activities that have been identified as having a potential for occupational exposure, including

(i) housekeeping practices designed to keep the workplace clean and free from spills, splashes or other accidental contamination,

(ii) work procedures to ensure that contaminated laundry is isolated, bagged and handled as little as possible, and

(iii) work procedures to ensure that laboratory or other samples containing a biological agent designated as a hazardous substance in section 5.1.1 are handled in accordance with the *Laboratory Biosafety Guidelines 3rd edition, 2004*, issued by the Public Health Agency of Canada;

(e) a description of personal protective equipment designed to eliminate or minimize occupational exposure;

(f) a program to inform workers about the contents of the exposure control plan and to provide them with adequate education, training and supervision to work safely with, and in proximity to, a biological agent designated as a hazardous substance in section 5.1.1;

(g) a record of all training and education provided to workers in the program described in paragraph (f);

(h) a record of all workers who have been exposed, while performing work activities, to a biological agent designated as a hazardous substance in section 5.1.1.

[Enacted by B.C. Reg. 319/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

6.35 Risk identification

Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

6.36 Controls

(1) Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

(1.1) On and after January 1, 2008, a needleless device or safety-engineered hollow bore needle must be used for the following procedures performed to care for or treat a person:

(a) withdrawal of body fluids;

(b) accessing a vein or artery;

(c) administration of medications or fluids;

(d) any other procedure involving the potential for an exposure to accidental parenteral contact for which a needleless system or safety-engineered hollow bore needle system is available.

(1.2) On and after October 1, 2008, any medical sharp used to care for or treat a person must be a safety-engineered medical sharp.

(1.3) Subsections (1.1) and (1.2) do not apply if

(a) use of the required device, needle or sharp is not clinically appropriate in the particular circumstances, or

(b) the required device, needle or sharp is not available in commercial markets.

(1.4) If more than one type of safety-engineered hollow bore needle or safety-engineered medical sharp is available in commercial markets, the needle or sharp that provides the highest level of protection from accidental parenteral contact must be used.

(1.5) For purposes of subsection (1.4), an employer must make a determination of the highest level of protection available based on information provided by manufacturers, independent testing agencies, objective product evaluation, or other reliable sources.

(1.6) Safe work procedures and practices relating to the use of safety-engineered hollow bore needles and safety-engineered medical sharps must be developed and implemented before use of these devices.

(2) Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

(3) Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

(4) Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

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

(6) Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

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

[Amended by B.C. Reg. 241/2006, effective January 1, 2007.]

[Amended by B.C. Reg. 106/2007, effective July 26, 2007.]

[Amended by B.C. Reg. 319/2007, effective February 1, 2008.]

6.37 Labels and identification

(1) A container holding a known or suspected biological agent designated as a hazardous substance in section 5.1.1 must be clearly identified by the biohazard symbol as described in the Hazardous Products Regulations (Canada) or by other means that indicates the presence of a biological agent.

(2) A laboratory sample of a known or suspected biological agent designated as a hazardous substance in section 5.1.1 must be transported only in accordance with the federal *Transportation of Dangerous Goods Act, 1992 (Canada)*.

[Enacted by B.C. Reg. 319/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

6.38 Education and training

Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

6.39 Vaccination

(1) An employer must offer vaccination against hepatitis B virus to all workers who are at risk of occupational exposure to that virus.

(2) If the *Communicable Disease Control Immunization Program Manual* issued by the BC Centre for Disease Control, as amended from time to time, lists a vaccine that protects against infection by a biological agent that is designated as a hazardous substance in section 5.1.1, the employer must offer the vaccination to all workers who are at risk of occupational exposure to that biological agent.

(3) Vaccinations offered under subsections (1) and (2) must be provided without cost to workers.

[Enacted by B.C. Reg. 319/2007, effective February 1, 2008.]

6.40 Medical evaluation

If a worker may have been exposed to the human immunodeficiency virus (HIV), hepatitis B virus or any other biological agent designated as a hazardous substance in section 5.1.1, the employer must advise the worker to seek immediate medical evaluation.

[Enacted by B.C. Reg. 319/2007, effective February 1, 2008.]

6.41 Records

Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

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Cytotoxic Drugs

6.42 Definition

In sections 6.43 to 6.58

"cytotoxic drug" means an agent that possesses a specific destructive action on certain cells or that may be genotoxic, oncogenic, mutagenic, teratogenic, or hazardous to cells in any way and includes most anti-cancer drugs.

6.43 Exposure control plan

If a worker is or may be occupationally exposed to a cytotoxic drug, the employer must develop and implement an exposure control plan meeting the requirements of section 5.54.

6.44 Information

If a cytotoxic drug is received, prepared, administered, stored or disposed of at a workplace, the employer must maintain and make readily available to workers information on its

(a) acute and chronic toxicity, including any potential reproductive hazard,

(b) acute exposure treatment, and

(c) safe handling.

[Amended by B.C. Reg. 21/2006, effective May 17, 2006.]

6.45 Labels

A container of a cytotoxic drug and a shelf or bin where a cytotoxic drug is regularly stored must be appropriately labelled.

6.46 Signs

Warning signs which are clearly visible and clearly state the identified hazards must be posted in all areas where cytotoxic drugs are stored or mixed.

6.47 List

Storage and preparation areas for cytotoxic drugs must be posted with a list of all cytotoxic drugs present in the workplace.

6.48 Procedures

(1) When a cytotoxic drug is received, prepared, administered, stored or disposed of, written safe work procedures must be developed and implemented for applicable aspects of receiving, storage, preparation, administration and waste handling.

(2) The work procedures required by subsection (1) must be readily available for reference by workers and where practicable, summaries of relevant procedures must be posted in the appropriate work areas.

[Amended by B.C. Reg. 21/2006, effective May 17, 2006.]

6.49 Reproductive toxins

(1) At any worksite where a worker is occupationally exposed to a cytotoxic drug that is a reproductive toxin, the employer must develop policy and procedures appropriate to the risk, which may include protective reassignment.

(2) The policy and procedures must inform workers about the reproductive toxin and identify ways to minimize exposure to the reproductive toxin for a worker who has advised the employer of pregnancy or intent to conceive a child.

6.50 Instruction

(1) A worker involved in any aspect of handling a cytotoxic drug must receive pre-job education and on-the-job training on the handling of this substance.

(2) The instruction required by subsection (1) must address the

(a) known health risks, including any potential reproductive hazards,

(b) relevant techniques and procedures for safe handling,

(c) proper use of protective equipment and materials, and

(d) spill and waste disposal procedures.

(3) The adequacy of instruction must be assessed when required by a change in the substance used, information available on the substance or a change in work procedures, and retraining provided where necessary.

6.51 Supervision

A worker involved in any aspect of cytotoxic drug handling must be effectively supervised.

6.52 Records

(1) The employer must maintain a record of all workers who prepare or administer cytotoxic drugs, including the name of the drugs handled, and when practicable, the number of preparations or administrations per week.

(2) Exposure records must be maintained for the duration of employment plus 10 years, and training records for 3 years from the date that the training occurred.

6.53 Drug preparation and administration

(1) All mixing, preparation and priming of administration sets with a cytotoxic drug must be performed in one centralized area in a specially designated Class II Type B biological safety cabinet that

(a) is exhausted to the outside atmosphere in a manner that prevents recirculation into any work area,

(b) has exhaust and ventilation systems that remain in operation for a sufficient period of time to ensure that no contaminants escape from the biological safety cabinet into the workplace, and

(c) is equipped with a continuous monitoring device to permit confirmation of adequate airflow and cabinet performance.

(2) The administration of cytotoxic drugs must be done by following safe work procedures.

[Amended by B.C. Reg. 21/2006, effective May 17, 2006.]

6.54 Disconnects

Syringes and intravenous sets used for cytotoxic drugs must have appropriate fittings, such as Luer locking fittings, which prevent accidental disconnection.

[Amended by B.C. Reg. 21/2006, effective May 17, 2006.]

6.55 Personal protective equipment

(1) Adequate personal protective equipment must be provided and worn whenever there is a risk of contact with a cytotoxic drug.

(2) For the purposes of subsection (1) personal protective equipment includes

(a) medical gloves that are manufactured and designed for use when handling cytotoxic drugs,

(b) a moisture resistant, long-sleeved gown with cuffs,

(c) if there is a risk of contact with aerosols, an approved respirator, and

(d) if there is a risk of eye contact, eye and face protection.

(3) Used gowns and gloves must not be worn outside the preparation, administration or storage area and must be handled as hazardous waste or contaminated linen.

(4) All other non-disposable personal protective equipment must be cleaned immediately after use.

[Amended by B.C. Reg. 21/2006, effective May 17, 2006.]

6.56 Personal hygiene

Eating, drinking, smoking, application of cosmetics or storage of food is prohibited in any area where a cytotoxic drug is mixed, administered or stored.

6.57 Waste disposal

(1) Adequate, leak-proof waste disposal containers, including sharps and solids containers, and distinctive plastic waste bags must be available in every area where cytotoxic drugs are prepared, administered or stored, and all cytotoxic drug-related waste must be placed into these containers or bags.

(2) Any excreta from a patient being treated with cytotoxic drugs that is handled by a worker must be treated as cytotoxic drug-related waste.

[Amended by B.C. Reg. 21/2006, effective May 17, 2006.]

6.58 Spills

(1) Written emergency procedures to address spills of a cytotoxic drug must be developed and implemented which address requirements for small spill cleanup, both inside and outside the biological safety cabinet, large spill cleanup, and personal decontamination.

(2) Spill kits, clearly labelled, must be kept in or near cytotoxic drug preparation, administration and storage areas and a sign detailing spill procedures must be posted in all such areas.

[Amended by B.C. Reg. 21/2006, effective May 17, 2006.]

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6.59 Application

Sections 6.60 to 6.69 apply to any workplace where a worker is or may be exposed to potentially hazardous levels of inorganic lead.

6.60 Exposure control plan

The employer must develop and implement an exposure control plan meeting the requirements of section 5.54 if workers are or may be exposed to lead in excess of 50% of the exposure limits, or if exposure through any route of entry could result in elevated lead body-burdens, as defined by the Board.

6.61 Air monitoring in construction projects

If there is a potential for hazardous exposure to airborne lead in a construction project, the employer must ensure that air monitoring is conducted

(a) during the first shift of the construction project involving lead, and

(b) as necessary throughout the project to ensure that controls are effective and respirators are adequate.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

6.62 Warning signs

Warning signs must be posted at the boundary of any work area where hazardous lead exposures could occur.

6.63 Personal hygiene

If exposure to finely divided lead or lead compounds results in the contamination of exposed skin or work clothing, the requirements for personal hygiene in Part 5 (Chemical Agents and Biological Agents) must be met.

6.64 Work surfaces

All surfaces in the work area must be kept as free as practicable from accumulations of lead dust.

6.65 Lead removal

Removal of lead dust must be done by a means which prevents the dispersal of finely divided lead into any work area.

6.66 Instruction and training

The employer must ensure that a worker who is at risk of exposure to lead is adequately instructed and trained in

(a) the hazards of lead,

(b) the written work procedures to be followed,

(c) the correct operation and use of any required engineering controls and personal protective equipment,

(d) personal hygiene and decontamination procedures, and

(e) the purpose and significance of any health monitoring.

6.67 Health protection

The employer must develop and implement an effective health protection program, in a manner acceptable to the Board, if a worker is exposed to potentially hazardous levels of lead.

6.68 Records

The employer must

(a) maintain records of risk assessments, worker exposures and worker training, and

(b) ensure that health monitoring records are maintained in a manner acceptable to the Board.

6.69 Primary lead smelters

An employer engaged in primary lead smelting is exempt from the requirement to maintain airborne lead concentrations at or below the exposure limit in lead processing areas, provided that in these areas the employer

(a) maintains the airborne lead concentrations as low as is reasonably achievable using the best available technology,

(b) establishes and maintains an acceptable health protection plan including the elements in section 5.54, to ensure that workers' blood lead levels are minimized,

(c) establishes provisions acceptable to the Board for the medical removal of workers, and

(d) submits a summary of the annual review to the Board.

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6.70 Definitions

In sections 6.70 to 6.109

"antisapstain" in reference to a pesticide, means any substance which is applied to freshly cut wood to control fungal growth;

"closed system" means a device and procedure for transferring a pesticide from one container to another in a manner that does not expose the operator to the pesticide;

"field" means any area, excluding a body of water, on or in which one or more crops are grown and includes but is not limited to a field of row crops, an orchard, a mushroom farm, a greenhouse, a nursery, a turf farm, a silviculture area and any similar area;

"fumigant" means a pesticide applied in the form of a gas or vapour to kill pests and which is typically applied in an enclosed space;

"pest" means an injurious, noxious or troublesome insect, fungus, weed, rodent, parasite or other organism;

"pesticide" means a micro-organism or material that is represented, sold, used or intended to be used to prevent, destroy, repel or mitigate a pest and includes

(a) a plant growth regulator, plant defoliator or plant desiccant, and

(b) a control product, other than a device, under the *Pest Control Products Act* (Canada);

"restricted entry interval" means the length of time representing a period of precaution that must elapse after the application of a pesticide, before an unprotected worker may be authorized to enter the treated portion of a building, structure, or field to which the pesticide has been applied;

"slightly toxic", *"moderately toxic"* or *"very toxic"* means, in reference to a pesticide, one containing active ingredients which have acute mammalian toxicities determined by an authority acceptable to the Board, expressed as the Lethal Dose 50% (LD_{50}) by oral or dermal routes of entry as follows:

Category	Oral LD_{50}	Dermal LD_{50}
Very toxic	0-50 mg/kg	0-200 mg/kg
Moderately toxic	over 50-500 mg/kg	over 200-1000 mg/kg
Slightly toxic	over 500 mg/kg	over 1000 mg/kg

and where the lowest LD_{50} by the oral or dermal route of entry determines the category of the pesticide, and if the LD_{50} is reported as a range, the lowest reported LD_{50} is used.

6.71 Application

Sections 6.72 to 6.109 apply to any workplace where pesticides are used, stored or handled, except for disinfectants, germicidal products, cleaners, antifouling paints and first aid treatments which are issued Pest Control Product numbers.

General Requirements

6.72 Pesticide labels

The employer must ensure that a pesticide for use in the workplace has been registered and labelled by the manufacturer in accordance with the *Pest Control Products Act* (Canada).

6.73 Labels and signs for treated materials

If pesticide residues on treated seedlots, plants and similar materials supplied for planting may pose a hazard to workers, the employer must ensure labels, placards or signs are provided with the treated materials stating

(a) the pesticides applied,

(b) the date of last application, and

(c) the hazards and precautions required for handling these materials.

6.74 Pesticide use

The employer must ensure that a pesticide for use in the workplace is used in accordance with the requirements stated on the label and with good application practice.

6.75 SDS

The employer must make readily available to workers an SDS or its written equivalent for all pesticides used at the workplace.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

6.76 Informing workers

The employer must ensure that workers occupying a building or structure where a pesticide is to be applied are informed of

(a) the intent to use the pesticide,

(b) the hazards associated with its use, and

(c) the precautions required during the operations.

Mixing, Loading and Applying Pesticides

6.77 Qualifications

(1) The employer must ensure that a worker or applicator who mixes, loads or applies a moderately or very toxic pesticide for use in a workplace or who cleans or maintains equipment used in the operations

(a) is 16 years of age or over, and

(b) holds a valid pesticide applicator certificate issued under the *Integrated Pest Management Act*.

(2) Subsection (1)(b) does not apply to the use of biocides and slimicides in pulp and paper operations, or to antisapstain materials.

(3) Workers involved in training for the purposes of obtaining a valid pesticide applicator certificate who are directly supervised by a qualified person are exempt from the requirement of subsection (1)(b) during the training period.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.78 Procedures

The employer must develop and implement written safe work procedures for the

(a) handling, mixing, storage and application of pesticides,

(b) cleanup and disposal of spilled pesticides, and

(c) summoning of first aid and medical assistance for workers overexposed to pesticides.

6.79 Health protection

Where, in the opinion of the Board, it is necessary to provide health monitoring for workers exposed to pesticides, employers and workers must participate as required by the Board, and records must be maintained in a manner acceptable to the Board.

6.80 Rescue

If a worker applies a moderately or very toxic pesticide in a greenhouse or similar enclosed space and the worker may be incapacitated during the application, the work must be done in such a manner that a rescue can be effected by another worker equipped and able to do so.

Equipment

6.81 General requirements

The employer must ensure that equipment used to mix, load or apply pesticides is

(a) constructed of materials which are chemically compatible with the pesticide in use if contact with the pesticide is likely to occur,

(b) operated only by trained persons,

(c) used in accordance with instructions from the pesticide supplier,

(d) maintained in a safe operating condition,

(e) cleaned, repaired and maintained by workers who have been adequately instructed in safe work procedures, and

(f) in a safe condition before maintenance or repair work is carried out, including welding operations.

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

6.82 Fixed stations

A fixed pesticide mixing, loading or application station must have

(a) openings on tanks secured as necessary to prevent accidental worker entry,

(b) shut-off devices at the discharge end of hoses and pipes leading from mixing tanks, and

(c) when required by the Board, a closed system for the mixing, loading or transferring of pesticides.

6.83 Mobile equipment

A tank, with a capacity of 200 litres (44 imp gal) or more, on mobile pesticide application equipment must have

(a) a device which indicates the fluid level, for equipment sold for first use after January 1, 1999,

(b) the openings secured to prevent spillage while the equipment is in use, and

(c) shut-off devices at the discharge end of hoses and pipes leading from the mixing tanks.

Pesticide Application

6.84 Safe application practice

(1) The employer must ensure that a pesticide is applied in a manner that controls the risk of adverse health effect or injury to any person.

(2) Before a pesticide is applied, the employer must ensure that all workers in the area that is to be treated and who are not required for the application of pesticides are moved to a safe location.

(3) If practicable, the employer must schedule a pesticide application in a building for a time when the building is unoccupied.

6.85 Posting warning signs

Before a moderately or very toxic pesticide or a fumigant is applied the employer must ensure that

(a) warning signs acceptable to the Board are conspicuously posted at normal points of worker entry to the area to be treated, and

(b) if a pesticide is applied in an enclosed space all entrances to the space are secured to prevent unauthorized persons from entering.

6.86 Design of warning signs

Warning signs must be of a design, construction and durability to be clearly identifiable for the prescribed posting period, and must provide information in a manner that can be readily understood by workers.

6.87 Warning signs for non-fumigants

Warning signs for the application of moderately and very toxic pesticides, other than fumigants in enclosed spaces, must display

(a) a skull and crossbones symbol,

(b) the word WARNING in a language that can be readily understood by the workers and in letters large enough to be read at a distance of 8 m (25 ft),

(c) the name of the pesticide and the date of application,

(d) the expiry date of the restricted entry interval as determined in section 6.89, and

(e) instructions to obtain permission to enter before the expiry date of the restricted entry interval.

6.88 Warning signs for fumigants

The warning sign for the application of a fumigant in an enclosed space must display

(a) a skull and crossbones symbol,

(b) the words DANGER, DEADLY FUMIGANT GAS, KEEP OUT in a language that can be readily understood by the workers and in letters large enough to be read at a distance of 8 m (25 ft),

(c) the name of the fumigant,

(d) the name of the applicator, and

(e) emergency telephone numbers for both day and night.

6.89 Restricted entry intervals

(1) Except where entry is permitted by section 6.90 or 6.91, the employer must ensure that a person does not enter a workplace or portion of a workplace where a pesticide has been applied, until the restricted entry interval has elapsed.

(2) The length of the restricted entry interval required by subsection (1) is a minimum of

(a) 24 hours for a pesticide which is classified as slightly toxic,

(b) 48 hours for a pesticide which is classified as moderately or very toxic, and for any mixture in which a moderately or very toxic pesticide is present, or

(c) the interval specified on a pesticide label if that interval is longer than the interval determined in paragraphs (a) or (b).

6.90 Authorization to enter

(1) If, before the expiry of the restricted entry interval, the employer authorizes a worker to enter a field, building or structure in which a pesticide has been applied the employer must ensure that

(a) the hazards to workers have been assessed by a qualified person,

(b) the worker is provided with and wears the proper personal protective clothing and equipment required by this Regulation, and

(c) the worker follows proper procedures.

(2) If the employer authorizes a worker to enter a building or structure in which a pesticide has been applied, the employer must ensure that

(a) where practicable, the treated area of the building is ventilated and the atmosphere has been tested or otherwise evaluated by a qualified person and declared safe to enter, and

(b) if a worker may be incapacitated after re-entry, provision has been made for rescue in a manner that meet the requirements of section 6.80.

6.91 Exemptions

(1) In a structural pesticide application, the employer is exempt from sections 6.85 to 6.90 when small quantities of slightly toxic pesticides are applied in a manner that minimizes the release of aerosols and residues on work surfaces, or moderately toxic pesticides are safely applied in restricted exposure applications such as crack and crevice treatments provided that

(a) areas treated with these pesticides are clearly identified to workers,

(b) the treated indoor space has been adequately ventilated,

(c) safe work procedures are used, including applicable restricted entry intervals stated on pesticide labels or provided by an authority acceptable to the Board,

(d) a hazardous accidental release does not occur during the application, and

(e) a qualified person inspects the area following application to determine that paragraphs (a) to (d) have been complied with and notifies the employer of the applicable restricted entry intervals and any additional entry precautions, and the employer implements the instructions of the qualified person.

(2) For a system used to handle and apply biocides and slimicides, the employer is exempt from the requirements of sections 6.85 to 6.90 with respect to warning signs and restricted entry intervals, provided that

(a) the system minimizes the release of aerosols and residues on work surfaces,

(b) areas where these pesticides are handled or used are identified to workers, and

(c) entry into these work areas is restricted to authorized workers.

6.92 Cleanup of residues

The employer must ensure that surfaces used for food preparation and eating, and work surfaces likely to come in contact with workers' unprotected skin are cleaned and free of pesticide residues.

6.93 Pesticide drift

(1) An employer must ensure that all reasonable precautions are taken to prevent the drift or spread of a pesticide from a workplace under the employer's control.

(2) If a pesticide under the control of an employer has drifted or spread to a workplace occupied or used

by another employer, the first employer must notify the second of the identity of the pesticide, the nature of its harmful characteristics and the precautions required for the safety of workers.

(3) The employer to whose property a pesticide has drifted or spread must take all reasonable steps to

(a) identify the pesticide and advise any persons who may be exposed to it of the nature of the pesticide, its harmful characteristics and the precautions required for safety, and

(b) ensure that any hazards to persons from exposure to the pesticide are eliminated or controlled.

6.94 Records

The employer must maintain a record of pesticide applications which includes, for each application,

(a) the pesticide used and location of application,

(b) the date and time at which the application was completed,

(c) the date on which workers were allowed to re-enter, and

(d) if applicable, the type of crop treated, rate of application and the number of acres or hectares treated.

Personal Hygiene

6.95 Wash and shower facilities

(1) The employer must supply and maintain adequate wash facilities and, if there is the risk of body contamination, shower facilities as required by section 5.82, to all workers when

(a) mixing, loading or applying pesticides, or handling concentrates or wet-treated lumber,

(b) cleaning, maintaining or handling equipment, materials or surfaces contaminated with pesticide residues, or

(c) entering fields where pesticides have been applied and where contact with pesticide residues may contaminate protective clothing and body areas.

(2) The wash and shower facilities required by subsection (1) must be in close proximity to the places where pesticides are used or handled, but must be separate from food preparation, lunchrooms and eating areas.

6.96 Worker cleanup

A worker must immediately cleanse any body area contaminated with pesticide.

6.97 Personal protective clothing and equipment

If a worker mixes, loads or applies pesticides or if a worker cleans, maintains or handles equipment, materials or surfaces contaminated with pesticide residues, the employer must ensure that

(a) the worker is provided with and wears suitable protective clothing and equipment,

(b) contaminated protective clothing and equipment is stored in a secure place and not used until it is laundered or otherwise cleaned,

(c) if required, adequate facilities or services to launder contaminated protective clothing are available,

(d) at least one change of outer protective clothing for each worker is available at the work site, and

(e) a change room or sheltered place is provided where workers can change clothes and store personal clothing while wearing protective clothing.

Avicides, Predicides, Rodenticides and Insecticidal Baits

6.98 Exemption

Sections section 6.80 and 6.85 to 6.91 do not apply where an avicide, predicide, rodenticide or insecticidal bait is used or applied in solid or liquid form, unless the pesticide label specifies otherwise.

6.99 Preventive measures

For a pesticide exempted in section 6.98 the employer must ensure that

(a) adequate measures are taken for the protection of the applicator including the use of safe work procedures, the provision and use of personal protective equipment and the provision of adequate hand washing facilities,

(b) the pesticide is applied, where practicable, in areas not readily accessible to unauthorized persons, and away from areas of normal work activity, and

(c) a worker who is required to enter the area or location where the pesticide has been applied is notified of the location of the pesticide application, the physical description of the pesticide and the device, if any, in which it is placed, and the precautions that must be observed.

Storage

6.100 Location

The employer must ensure that pesticides are not stored in areas where food preparation occurs, in lunchrooms, or in food storage areas.

6.101 Storage facilities

(1) The employer must supply a pesticide storage facility that meets the design criteria stated in the manual *Standard Practices for Pesticide Applicators,* published by the Workers' Compensation Board of BC, for the storage of bulk or reserve quantities of pesticides.

(2) Factors that must be considered in the facility design include

(a) maintenance of minimal quantities,

(b) compatibility of pesticides,

(c) strength of shelving materials, and

(d) containment of spills.

6.102 Retail displays

The employer must ensure that shelving and retail displays for pesticides are designed to provide safe storage and to minimize the possibility of spills.

Antisapstain Applications

6.103 Substitution

An employer must investigate antisapstain materials and, whenever practicable, substitute an alternate material for a material in use, if

(a) the hazards of the substitute are known, and

(b) the risk to workers is reduced.

6.104 Ventilation

(1) The employer must install and maintain an effective local exhaust ventilation system on all spray box application equipment to contain overspray and control worker exposure to the chemicals.

(2) The employer must ensure that the ventilation system for a spray box provides an inward air flow across the hood face at least equal to the velocity of the lumber on the outfeed conveyor.

6.105 Cleaning equipment

The employer must clean a metal surface of antisapstain material before any welding, burning or cutting operation is done on it.

6.106 Excess chemical

The employer must control the flooding of wood being treated by the use of

(a) mist eliminators,

(b) curtains on the spray box enclosure openings,

(c) regulation of the spray flows, or

(d) other acceptable measures.

6.107 Protective clothing

A worker handling wet treated lumber must remove protective equipment before leaving the restricted work area.

6.108 Records

The employer must keep records and SDSs on all previously used antisapstain materials if a change of chemical has occurred and the equipment or work areas have not been adequately decontaminated, and this information must be readily available to workers.

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

6.109 Exemption

(1) The requirements of sections 6.85 to 6.91 with respect to warning signs and restricted entry intervals do not apply to the application of antisapstain materials, unless the pesticide label specifies otherwise.

(2) Areas of antisapstain application must be clearly identified to workers.

(3) Entry into work areas where antisapstain materials are handled or applied must be restricted to authorized personnel.

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6.110 Application

Sections 6.110 to 6.115 apply to rock crushing, drilling, mucking, excavation, loading, transportation, road grading, road construction or conveying of rock or similar operations.

6.111 Dust control

(1) The employer must ensure that dust concentrations to which a worker may be exposed are maintained at or below the established exposure limits, by one or a combination of

(a) mechanical ventilation,

(b) the use of water spray,

(c) other equally effective methods.

(2) When practicable, ventilation systems for removing dust must be equipped with effective filtration.

6.112 Restricted access

The employer must ensure that only those properly protected workers who are necessary to perform the work are permitted in a dust hazard area.

6.113 Rock drills

A rock drill, other than a manually-powered rock drill, must be equipped with a dust suppression system, acceptable to the Board, that

(a) uses water jet, spray, or other equally effective means to suppress drilling dust effectively, and

(b) operates whenever the drill is in use.

6.114 Rock crushing plants

Rock crushing plants must be equipped with the following dust controls:

(a) rock crushers, including jaw, roll, cone, or hammer-mills must have an effective mechanical exhaust system;

(b) screens releasing dust must be partially covered and have an effective mechanical exhaust system or an effective water spray system;

(c) the screen discharge hopper must be enclosed and if dust is released must have an effective mechanical exhaust system or an effective water spray system;

(d) material transfer points releasing dust must have an effective mechanical exhaust system or an effective water spray system;

(e) a suitable dust collector must be installed on a mechanical exhaust system;

(f) dust discharged from a mechanical exhaust ventilation system must not be recirculated into work areas;

(g) when practicable, the operator must be enclosed in a pressurized cab equipped with air filtration and noise suppression.

6.115 Asphalt mixing plants

Asphalt mixing plants must be equipped with the following dust controls:

(a) a dust-tight seal must be installed at the dryer discharge to the hot stone elevator;

(b) the screen enclosure must have a mechanical exhaust system that maintains a negative pressure within the screen enclosure and the elevator feed system;

(c) the mixing chamber must have a mechanical exhaust system that maintains a negative pressure on the bin discharge to the mixer or elevator feed system;

(d) on continuous-mix plants the conveyor feeding the mixing chamber must be enclosed and connected

to the mechanical exhaust system;

(e) the screen overflow chutes and hoppers handling screen overflow must be enclosed, and the waste fines conveyor system must be enclosed at all material transfer and discharge points;

(f) the discharge of overflow or waste fines material must be to an enclosed container, which must be emptied in a manner that prevents contamination of the work area;

(g) material transfer points between sections of the asphalt mixing plant must be fitted with effective dust seals;

(h) conveyor and elevator cover seals must be dust-tight;

(i) on batch-mix plants, dust-tight seals must be installed on manual draw chute levers and on the weigh-hopper and bin;

(j) a suitable dust collector must be installed on the mechanical exhaust system, with the discharge from the dust collector located so as to prevent the recirculation of contaminated air to areas occupied by workers.

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Toxic Process Gases

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6.116 Definitions

In sections 6.117 to 6.132

"enclosure" means a room, cabinet or separation designed to contain equipment, machinery and vessels and to isolate accidental releases of toxic gas;

"toxic process gas" means a gas which

(a) meets the HPR Health Hazard Class — Acute Toxicity, Categories 1, 2 and 3 or the categories set out in the following table:

HPR Health Hazard Classes	Hazard categories						
Skin corrosion / irritation		1A	1B	1C	2		
Serious eye damage / irritation	1					2A	2B
Respiratory or skin sensitization		1A	1B				
Mutagenicity		1A	1B		2		
Carcinogenicity		1A	1B		2		

Reproductive toxicity		1A	1B		2		
Specific organ toxicity (repeated exposure)	1				2		

and

(b) is used for purposes of

(i) an industrial process in which a precursor is changed into a product,

(ii) refrigeration by means of a piped installation, or

(iii) treatment of materials, for example, in a disinfection system.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

6.117 Application

Sections 6.118 to 6.132 apply to operations in which a toxic process gas is used, but do not apply to the handling or storage of flammable fuel gases or vapours, toxic waste emissions or the use of toxic process gases in manufactured articles.

6.118 Risk assessment

The employer must ensure that a risk assessment is conducted for toxic process gases.

6.119 Exposure control plan

If there is a risk of adverse health effect to workers from exposure to a toxic process gas, based on the risk assessment, the employer must develop and implement an exposure control plan meeting the requirements of section 5.54.

6.120 Procedures

(1) The employer must ensure that written work procedures providing instructions for the safe handling of the toxic process gas are prepared for all hazardous tasks in accordance with the risk assessment results, critical technical information and operations manuals.

(2) The employer must ensure that emergency procedures designed for the safe evacuation and rescue of all workers are established and tested on a regular basis.

(3) The procedures required by subsections (1) and (2) must be readily available to the workers at the workplace.

6.121 Education and training

The employer must ensure that

(a) workers are capable of operating the equipment and machinery in a safe manner by providing effective education and training, and

(b) records of education and training are maintained.

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

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

6.122 Enclosure

Where practicable, the employer must locate equipment and machinery such as tanks and compressors, handling toxic process gases in a separate enclosure that is

(a) designed, constructed and maintained to prevent fugitive emissions and accidental releases from entering occupied work areas,

(b) provided with exhaust ventilation to ensure an effective inward air flow into the enclosure at all times,

(c) provided with a safe means of entry and exit,

(d) designated as a restricted work area limited to entry by authorized personnel, and

(e) posted with signs which clearly identify the hazards and the precautions required for safe entry.

6.123 Testing

The employer must provide a safe means to check and test conditions inside an enclosure before entry by authorized workers.

6.124 Ventilation

The employer must

(a) ensure that ventilation systems are designed to exhaust toxic process gases directly to the outdoors in a safe manner,

(b) ensure that grilles providing makeup air from adjacent occupied areas are equipped with gas-rated, back-draft dampers,

(c) monitor critical parts of the ventilation systems, such as fan, motor and air flow, to ensure that workers are alerted to a malfunction of the system,

(d) ensure that ventilation ducting is vapour proof, dedicated and resistant to corrosion by the gas it carries, and

(e) where practicable, locate the fans on the outside of the building or structure to maintain the duct work within occupied work areas under a negative pressure differential.

6.125 Emergency ventilation

The employer must provide emergency ventilation that can be safely activated in emergency situations to ensure containment and control of an accidental release of a toxic process gas.

6.126 Shut-down device

(1) In the event of an emergency or accidental release, the employer must ensure that

(a) the gas supply can be shut down manually from a remote location or by the alarm system so as to isolate the reserve supply within the system and stop the generation or flow of the gas, or

(b) if the control measures required by paragraph (a) are not practicable, other effective measures, acceptable to the Board, are implemented to protect workers and other persons from exposure to the gas.

(2) When an automated or remote shut-down device is activated, the employer must ensure that operators are alerted to the emergency shut-down of the system.

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

6.127 Personal protective equipment

(1) The employer must provide appropriate personal protective equipment and ensure that workers wear it.

(2) A worker performing a hazardous work procedure on equipment or machinery where there is the risk of toxic process gas being released directly into the breathing zone, such as cylinder changing, system or line purging or draining, and leak detection and repair, must wear an appropriate respirator.

(3) A worker entering a restricted access enclosure must wear or carry an escape respirator.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

6.128 Monitors and alarms

(1) Where practicable, the employer must install continuous monitoring systems that detect fugitive emissions and accidental releases and effectively determine work conditions within the restricted access area.

(2) Continuous monitors must be connected to alarm systems to adequately warn workers of hazardous conditions and, when practicable, must be designed to safely activate appropriate control measures when emergency situations are detected.

(3) Monitoring and alarm systems must be

(a) tested at least monthly for proper operation, and

(b) calibrated at least annually

by authorized personnel using procedures set out in section 4.3 (2) or other procedures acceptable to the

Board.

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

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

6.129 Pressure relief alarm systems

(1) The employer must ensure that all pressure relief valves or similar safety-release devices direct relief gases to the outdoors in a safe manner.

(2) The employer must ensure that an alarm or any other reporting system designed to inform the operators of a malfunction or emergency activates if a pressure relief safety device is engaged.

6.130 Identification of controls

The employer must ensure that

(a) all critical components of equipment and machinery handling toxic process gases are clearly identified, and

(b) the function of every control device can be readily determined.

6.131 Piping systems

(1) The employer must ensure that a piping system is

(a) constructed of compatible materials resistant to corrosion by the gas it carries,

(b) constructed to withstand the system pressures to which it will be subjected, and

(c) safely routed, supported and protected from impact damage, shock and vibration.

(2) The employer must ensure that piping and valve systems are leak and pressure tested, as required, before the system is put into operation.

(3) The employer must ensure that piping systems are equipped with isolation, pressure venting or bleed valves designed to purge the lines safely of residual gases before maintenance or servicing procedures.

6.132 Maintenance

The employer must ensure that the servicing and maintenance of equipment and machinery addresses all critical components.

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

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Part 7 Noise, Vibration, Radiation and Temperature

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Division 1 Noise Exposure

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7.1 Definition

(1) In this Division, *"noise exposure limits"* means either of the noise exposure limits established under section 7.2.

(2) Noise terminology and measurements used or described in this Division have the same meaning that they have in

(a) *CSA Standard Z107.56-94, Procedures for the Measurement of Occupational Noise Exposure*, as amended from time to time, and

(b) *ANSI Standard S1.25-1991, Specification for Personal Noise Dosimeters,* as amended from time to time.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.2 Noise exposure limits

An employer must ensure that a worker is not exposed to noise levels above either of the following exposure limits:

(a) 85 dBA Lex daily noise exposure level;

(b) 140 dBC peak sound level.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.3 Noise measurement required

(1) If a worker is or may be exposed to potentially harmful levels of noise, or if information indicates that a worker may be exposed to a level exceeding 82 dBA Lex, the employer must measure the noise exposure.

(2) The noise exposure measurement must

(a) be performed in accordance with *CSA Standard Z107.56-94, Procedures for the Measurement of Occupational Noise Exposure*, as amended from time to time, except as otherwise determined by the Board, and

(b) be updated if a change in equipment or process affects the noise level or the duration of noise exposure.

(3) Except as otherwise determined by the Board, noise dosimeters and sound level meters used for measuring noise exposure must meet the requirements of *ANSI Standard S1.25-1991, Specification for Personal Noise Dosimeters,* as amended from time to time.

(4) The employer must inform affected workers of the results of any noise exposure measurement and the significance of the measurement to risk of hearing loss.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.4 Exemption

An employer is not required to measure the noise exposure of a worker if

(a) based on other information, the employer identifies the worker as being exposed to noise in excess of an exposure limit, and

(b) the employer establishes an effective noise control and hearing conservation program for that worker.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.5 Noise control and hearing conservation program

If noise in the workplace exceeds either of the noise exposure limits, the employer must develop and implement an effective noise control and hearing conservation program with the following elements:

(a) noise measurement;

(b) education and training;

(c) engineered noise control;

(d) hearing protection;

(e) posting of noise hazard areas;

(f) hearing tests;

(g) annual program review.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.6 Engineered noise control

If a worker is exposed to noise above a noise exposure limit, the employer must

(a) investigate options for engineered noise control, and

(b) when practicable, implement one or more of those options to reduce noise exposure of workers to or below the exposure limits.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.7 Hearing protection and warning signs

(1) If it is not practicable to reduce noise levels to or below noise exposure limits, the employer must

(a) reduce noise exposure to the lowest level practicable,

(b) post warning signs in the noise hazard areas,

(c) give to affected workers hearing protection that meets the requirements of *CSA Standard Z94.2-02, Hearing Protection Devices - Performance, Selection, Care, and Use*, as amended from time to time, except as otherwise determined by the Board, and maintain the hearing protection so that it continues to meet those standards, and

(d) ensure that hearing protection is worn effectively in noise hazard areas.

(2) Workers in a posted noise hazard area must wear hearing protection.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.8 Hearing tests

(1) The employer must give workers who are exposed to noise that exceeds noise exposure limits

(a) an initial hearing test as soon as practicable after employment starts, but not later than 6 months after the start of employment, and

(b) a test at least once every 12 months after the initial test.

(2) Hearing tests must be administered by a hearing tester authorized by the Board.

(3) The employer must ensure that the authorized hearing tester sends the test results to the Board.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.9 Records to be kept

The employer must keep records of

(a) the annual hearing test results for each worker, which must

(i) be kept as long as the worker is employed by the employer, and

(ii) be kept confidential and not released to anyone without the written permission of the worker, or as otherwise required by law,

(b) the education and training provided to workers, and

(c) the results of noise exposure measurements taken under section 7.3.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

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7.10 Definitions

In this Division:

"hand-arm vibration" means vibration that is transmitted from vibrating surfaces of objects, such as hand tools, through the hands and arms;

"vibration exposure limits" means the limits referred to in section 7.11;

"whole-body vibration" means vibration that is transmitted to a worker's body from vibrating surfaces on which a worker stands or sits.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.11 Vibration exposure limits

An employer must ensure, to the extent practicable, that workers are not exposed to vibration in excess of the limits specified in

(a) for hand-arm vibration, the American Conference of Governmental Industrial Hygienists publication entitled *Threshold Limit Values and Biological Exposure Indices,* dated 2003, as amended from time to time;

(b) for whole-body vibration, *ANSI Standard S3.18-2002/ISO 2631-1-1997, Mechanical Vibration and Shock - Evaluation of Human Exposure to Whole Body Vibration - Part 1: General Requirements,* as amended from time to time;

except as otherwise determined by the Board.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.12 Evaluation of vibration

The evaluation of hand-arm vibration and whole-body vibration must be conducted by the employer in accordance with

(a) for hand-arm vibration, *ISO Standard 5349-1:2001, Mechanical Vibration - Measurement and Evaluation of Human Exposure to Hand-transmitted Vibration - Part 1: General Requirements* and *ISO Standard 5349-2:2001, Mechanical Vibration - Measurement and Evaluation of Human Exposure to Hand-transmitted Vibration - Part 2: Practical Guidance for Measurement at the Workplace,* as amended from time to time;

(b) for whole-body vibration, *ANSI Standard S3.18-2002/ISO 2631-1-1997, Mechanical Vibration and Shock - Evaluation of Human Exposure to the Whole Body Vibration - Part 1: General Requirements,* as amended from time to time;

except as otherwise determined by the Board.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.13 Vibration exposure control obligations

The employer must, if a worker is or may be exposed to vibration in excess of the vibration exposure limits, develop and implement an exposure control plan that meets the requirements of section 5.54(2).

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.14 Information about vibration hazards

The employer must, if a worker is exposed to levels of vibration above the vibration exposure limits, inform the worker of the nature of the hazard and possible adverse effects.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.15 Labels

If the manufacturer of equipment that produces levels of vibration in excess of the vibration exposure limits does not label the equipment to identify the hazard, the employer is responsible for doing so.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.16 Exposure to cold and hand-arm vibration

When a worker is exposed to hand-arm vibration, the employer, to the extent practicable, must ensure that the worker's hands or arms are not exposed to cold, either

(a) from the environment in which the worker is working or as a result of using equipment, or

(b) from coming into contact with cold objects.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

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Division 3 Radiation Exposure

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7.17 Definitions

In this Division:

"action level, ionizing radiation" means an effective dose of 1 milliSievert (mSv) per year;

"action level, non-ionizing radiation" means the exposure limits for the general public referred to in section 7.19(4) or, if no public limit is referred to, it means the maximum exposure limit for workers referred to in section 7.19(4);

"effective dose" means the amount of ionizing radiation, measured in mSv, absorbed by the worker's whole body, adjusted for the energy level and type of radiation and the differing susceptibilities of the organs and tissues irradiated, and if only part of the body is exposed the effective dose is the sum of the weighted equivalent doses in all irradiated tissues and organs;

"equivalent dose" means the amount of ionizing radiation, measured in mSv, absorbed by a specific body part and adjusted for the energy level and type of radiation.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.18 Application

(1) This Division applies to all sources of ultrasonic energy, non-ionizing and ionizing radiation, including radiation sources governed by the *Nuclear Safety and Control Act* (Canada), except as otherwise determined by the Board.

(2) This Division does not apply to medical or dental radiation received by a patient, or to natural background radiation, except as specified by the Board.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.19 Exposure limits

(1) A worker's exposure to ionizing radiation must not exceed any of the following:

(a) an annual effective dose of 20 mSv;

(b) an annual equivalent dose of

(i) 150 mSv to the lens of the eye,

(ii) 500 mSv to the skin, averaged over any 1 cm^2 area at a nominal depth of 7 mg/cm^2, regardless of the area exposed, or

(iii) 500 mSv to the hands and feet.

(2) If a worker declares her pregnancy to the employer, her effective dose of ionizing radiation, for the remainder of the pregnancy, from external and internal sources, must be limited by the employer to the lesser of

(a) 4 mSv, or

(b) the dose limit specified for pregnant workers under the *Nuclear Safety and Control Act* (Canada).

(3) The employer must ensure that the exposure of workers to ionizing radiation is kept as low as reasonably achievable below the exposure limits.

(4) The employer must ensure that a worker's exposure to non-ionizing radiation does not exceed the exposure limits specified in

(a) for radiofrequency:

(i) *Health Canada Safety Code 25, Short-Wave Diathermy Guidelines for Limiting Radiofrequency Exposure,* 1983, as amended from time to time;

(ii) *Health Canada Safety Code 26, Guidelines on Exposure to Electromagnetic Fields from Magnetic Resonance Clinical Systems,* 1987, as amended from time to time;

(iii) *Health Canada Safety Code 6, Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz,* 1999, as amended from time to time, and

(b) for lasers:

(i) *ANSI Standard Z136.1-2000, Safe Use of Lasers,* as amended from time to time;

(ii) *ANSI Standard Z136.2-1997, Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources,* as amended from time to time;

(iii) *ANSI Standard Z136.3-1996, Safe Use of Lasers in Health Care Facilities,* as amended from time to time;

(iv) *CSA Standard Z386-01, Laser Safety in Health Care Facilities*, as amended from time to time,

except as otherwise determined by the Board.

(5) A worker's exposure to ultraviolet radiation produced by equipment or industrial processes must not exceed the threshold limit values specified in the American Conference of Governmental Industrial Hygienists publication entitled *Threshold Limit Values and Biological Exposure Indices,* dated 2003, as amended from time to time.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.20 Exposure control plan

(1) If a worker exceeds or may exceed an action level, ionizing radiation or action level, non-ionizing radiation, the employer must develop and implement an exposure control plan meeting the requirements of section 5.54(2).

(2) The instructions to workers developed under subsection (1) must be posted or otherwise available in the work area or near the applicable equipment controls.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.21 Reproductive hazards

(1) The employer must ensure that every worker who exceeds, or may exceed, the action level, ionizing radiation is fully informed of any potential reproductive hazards associated with exposure to ionizing radiation.

(2) When requested by a pregnant worker or by a worker intending to conceive a child, the employer must make counselling available with respect to the reproductive hazards associated with exposure to ionizing radiation.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.22 Monitoring exposure

Unless exempted by the Board, if a worker exceeds or may exceed the action level, ionizing radiation, the employer must ensure that the worker is provided with and properly uses a personal dosimeter acceptable to the Board.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.23 Standards for use of equipment

Equipment producing ionizing or non-ionizing radiation or ultrasonic energy must be installed, operated and maintained in accordance with the following:

(a) for ionizing radiation:

(i) *Health Canada Safety Code 20A, X-Ray Equipment in Medical Diagnosis Part A: Recommended Safety Procedures for Installation and Use,* 1980, as amended from time to time;

(ii) *Health Canada Safety Code 27, Requirements for Industrial X-Ray Equipment Use and Installation,* 1987, as amended from time to time;

(iii) *Health Canada Safety Code 28, Radiation Protection in Veterinary Medicine - Recommended Safety Procedures for Installation and Use of Veterinary X-Ray Equipment,* 1991, as amended from time to time;

(iv) *Health Canada Safety Code 29, Requirements for the Safe Use of Baggage X-Ray Inspection Systems,* 1993, as amended from time to time;

(v) *Health Canada Safety Code 30, Radiation Protection in Dentistry – Recommended Safety Procedures for the Use of Dental X-Ray Equipment,* 1999, as amended from time to time;

(vi) *Health Canada Safety Code 31, Radiation Protection in Computed Tomography Installation,* 1994, as amended from time to time;

(vii) *Health Canada Safety Code 32, Safety Requirements and Guidance for Analytical X-Ray Equipment,* 1994, as amended from time to time;

(viii) *Health Canada Safety Code 33, Radiation Protection in Mammography,* 1995, as amended from time to time;

(b) for radiofrequency:

(i) *Health Canada Safety Code 25, Guidelines for Limiting Radiofrequency Exposure – Short-Wave Diathermy,* 1983, as amended from time to time;

(ii) *Health Canada Safety Code 26, Guidelines on Exposure to Electromagnetic Fields from Magnetic Resonance Clinical Systems,* 1987, as amended from time to time;

(iii) *Health Canada Safety Code 6, Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz,* 1999, as amended from time to time;

(c) for lasers:

(i) *ANSI Standard Z136.1-2000, Safe Use of Lasers,* as amended from time to time;

(ii) *ANSI Standard Z136.2-1997, Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources,* as amended from time to time;

(iii) *ANSI Standard Z136.3-1996, Safe Use of Lasers in Health Care Facilities,* as amended from time to time;

(iv) *CSA Standard Z386-01, Laser Safety in Health Care Facilities*, as amended from time to time;

(d) for infrared and ultraviolet:

(i) *CSA Standard CAN/CSA-C22.2 No. 224-M89 (R1994), Radiant Heaters and Infrared and Ultraviolet Lamp Assemblies for Cosmetic or Hygienic Purposes in Nonmedical Applications*, as amended from time to time;

(e) for ultrasound:

(i) *Health Canada Guidelines for the Safe Use of Diagnostic Ultrasound,* 2001, as amended from time to time;

(ii) *Health Canada Safety Code 24, Guidelines for the Safe Use of Ultrasound: Part II – Industrial and Commercial Applications,* 1991, as amended from time to time,

except as otherwise determined by the Board

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.24 Radiation surveys

Except as otherwise determined by the Board, the employer must conduct a radiation survey for ionizing radiation in accordance with the standard practice specified under the applicable Safety Code listed in section 7.23(a) or the regulations under the *Nuclear Safety and Control Act* (Canada),

(a) at the times required by the Safety Code or regulations, as the case requires,

(b) if equipment has been damaged or modified, or

(c) if there is an indication of an unusually high exposure of a worker to ionizing radiation.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.25 Records

The employer must

(a) maintain and make available to the Board,

(i) for at least 10 years, records of radiation surveys, and

(ii) for the period that the worker is employed plus 10 years, records of exposure monitoring and personal dosimetry data, and

(b) make the records available to workers.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

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7.26 Definitions

In this Division:

"ACGIH Standard" means the American Conference of Governmental Industrial Hygienists publication entitled *Threshold Limit Values and Biological Exposure Indices,* dated 2003, as amended from time to time, except as otherwise determined by the Board;

"unacclimatized worker" means a worker who is not accustomed to working in a hot environment or who has been out of a hot environment for seven consecutive days.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

Heat Exposure

7.27 Application

(1) Subject to subsection (2), sections 7.28 to 7.32 apply to a workplace if

(a) a worker is or may be exposed to thermal conditions which could cause heat stress,

(b) the thermal conditions could result in a worker's core body temperature exceeding 38°C (100°F), or

(c) the thermal conditions are in excess of the levels listed in the screening criteria for heat stress exposure in the heat stress and strain section of the ACGIH Standard for unacclimatized workers.

(2) Subsection (1) does not apply to firefighting if special provisions, satisfactory to the Board, are in place to ensure that the firefighter's core body temperature is maintained below 38°C (100°F).

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.28 Exposure limits

(1) A worker must not be exposed to levels that exceed those listed in the screening criteria for heat stress exposure in the heat stress and strain section of the ACGIH Standard.

(2) Clothing corrections must be applied in accordance with the heat stress and strain section of the ACGIH Standard.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.29 Heat stress assessment and exposure control plan

(1) If a worker is or may be exposed to the conditions specified in section 7.27, the employer must

(a) conduct a heat stress assessment to determine the potential for hazardous exposure of workers, using measures and methods that are acceptable to the Board, and

(b) develop and implement a heat stress exposure control plan meeting the requirements of section 5.54(2).

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.30 Heat stress controls

(1) If a worker is or may be exposed to the conditions specified in section 7.27, the employer must implement engineering controls to reduce the exposure of workers to levels below those listed in the screening criteria for heat stress exposure in the heat stress and strain section of the ACGIH Standard.

(2) If the action described in subsection (1) is not practicable, the employer must reduce the exposure of workers to levels below those listed in the screening criteria for heat stress exposure in the heat stress and

strain section of the ACGIH Standard by providing

(a) administrative controls, including a work-rest cycle, acceptable to the Board, or

(b) personal protective equipment, if the equipment provides protection equally effective as administrative controls.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.31 Provision of water

If a worker is or may be exposed to the conditions specified in section 7.27, the employer must provide and maintain an adequate supply of cool potable water close to the work area for the use of a heat exposed worker.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.32 Removal from and treatment for heat exposure

If a worker shows signs or reports symptoms of heat stress or strain, the worker must be removed from the hot environment and treated by an appropriate first aid attendant, if available, or by a physician.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

Cold Exposure

7.33 Application

Sections 7.34 to 7.38 apply to a workplace if a worker is or may be exposed to

(a) thermal conditions that could cause cold stress or injury,

(b) thermal conditions that could cause a worker's core body temperature to fall below 36°C (96.8°F), or

(c) thermal conditions that are below the levels classified as "little danger" to workers in the criteria for the cooling power of wind on exposed flesh in the cold stress section of the ACGIH Standard.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.34 Cold stress assessment and exposure control plan

If a worker is or may be exposed to the conditions specified in section 7.33, the employer must

(a) conduct a cold stress assessment to determine the potential for hazardous exposure of workers, using measures and methods that are acceptable to the Board, and

(b) develop and implement a cold exposure control plan meeting the requirements of section 5.54(2).

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.35 Cold stress controls

(1) If a worker is or may be exposed to the conditions specified in section 7.33, the employer must implement effective engineering controls to reduce the exposure hazard to levels above those classified as "little danger" to workers in the criteria for the cooling power of wind on exposed flesh in the cold stress section of the ACGIH Standard.

(2) If the action described in subsection (1) is not practicable, the employer must reduce the exposure hazard by providing

(a) effective administrative controls, or

(b) personal protective equipment, if the equipment provides protection equally effective as administrative controls.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.36 Heated shelters

If a worker is exposed to a thermal environment with an equivalent chill temperature less than -7°C (19°F), as determined using the criteria for the cooling power of wind on exposed flesh in the cold stress section of the ACGIH Standard, a nearby heated shelter must be available to the worker.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.37 Clothing and personal protective equipment

(1) A worker who is or may be exposed to the conditions referred to in section 7.33 must wear adequate insulating clothing and personal protective equipment.

(2) If work takes place outdoors in snow or ice covered terrain where excessive ultraviolet light, glare or blowing ice crystals present a risk of injury to the eyes, workers must wear eye protection appropriate to the hazards.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

7.38 Removal and treatment

If a worker exposed to cold shows signs or reports symptoms of cold stress or injury, the worker must be removed from further exposure and treated by an appropriate first aid attendant, if available, or a physician.

[Enacted by B.C. Reg. 382/2004, effective January 1, 2005.]

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Part 8 Personal Protective Clothing and Equipment

Part 8 Contents

Personal Protective Clothing and Equipment Definitions

8.1 Definitions

(1) In this Part

"flame resistant" in reference to clothing, means made of a material that, due to its inherent properties or as a result of treatment by a flame retardant, will slow, terminate or prevent flaming combustion;

"lifejacket" means a device that, when worn correctly, provides a specified buoyancy that will turn the wearer face-up on entering the water, and will keep the wearer in this position;

"no significant hazard of rollover" means an area where there are no grades exceeding 10%, no operating areas with open edges, no open ramps, loading docks, ditches or similar hazards which might cause a rollover;

"personal flotation device (PFD)" means a device that, when worn correctly, provides a specified buoyancy to support a conscious person in an upright or backward leaning position, but is not designed to turn a person from a face-down to a face-up position in the water;

"specific location" means a yard, plant, or other clearly defined and limited area in which mobile equipment is operated, but does not include an entire municipality, district, transient forestry operation or construction site.

(2) In this Part, *"8-hour TWA limit"*, *"ACGIH"*, *"ceiling limit"* and *"short-term exposure limit"* have the same meaning as in section 5.1.

[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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8.2 Responsibility to provide

(1) A worker is responsible for providing

(a) clothing needed for protection against the natural elements,

(b) general purpose work gloves and appropriate footwear including safety footwear, and

(c) safety headgear.

(2) An employer is responsible for providing, at no cost to the worker, all other items of personal protective equipment required by this Regulation.

(3) If the personal protective equipment provided by the employer causes allergenic or other adverse health effects, the employer must provide appropriate alternate equipment or safe measures<

(4) Nothing in this section precludes or alters an existing or future agreement between a worker or workers and an employer to the effect that the employer will be responsible for the provision either at no cost or some cost to the worker, of any or all of the items described in subsection (1).

Note: Part 8 provides requirements for most types of protective clothing and equipment. See Part 7 on Noise for hearing protection requirements.

8.3 Selection, use and maintenance

(1) Personal protective equipment must

(a) be selected and used in accordance with recognized standards, and provide effective protection,

(b) not in itself create a hazard to the wearer,

(c) be compatible, so that one item of personal protective equipment does not make another item ineffective, and

(d) be maintained in good working order and in a sanitary condition.

(2) If the use of personal protective equipment creates hazards equal to or greater than those its use is intended to prevent, alternative personal protective equipment must be used or other appropriate measures must be taken.

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

8.4 Workplace Evaluation

If an evaluation of workplace conditions is required to determine appropriate personal protective equipment, the evaluation, where practicable, must be done in consultation with the joint committee or the worker health and safety representative, as applicable, and with the worker who will use the equipment.

8.5 Program

If personal protective equipment is required to protect against a chemical exposure or an oxygen deficient atmosphere the employer must implement an effective protective equipment program at the workplace which includes

(a) a statement of purpose and responsibilities,

(b) written procedures for selection, use, inspection, cleaning, maintenance and storage of protective equipment, when required,

(c) instruction and training in the correct use and maintenance of the equipment,

(d) for respirators, medical assessment of respirator wearers, when required,

(e) documentation when required, and

(f) program review.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

8.6 Annual review

(1) The personal protective equipment program must be reviewed annually by the employer in consultation with the joint committee or the worker health and safety representative, as applicable

(2) The annual review must

(a) assess exposure control measures to ensure their continued effectiveness,

(b) determine the need for further control,

(c) ensure the adequacy of instruction, and

(d) for respirators, assess the adequacy of exposure monitoring data and assess the need for further monitoring, and ensure the adequacy of the fit test program.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

8.7 Instruction

The employer must ensure that a worker who wears personal protective equipment is adequately instructed in the correct use, limitations and assigned maintenance duties for the equipment to be used.

8.8 Supervisor's responsibilities

The supervisor must ensure that appropriate personal protective equipment is

(a) available to workers,

(b) properly worn when required, and

(c) properly cleaned, inspected, maintained and stored.

8.9 Worker's responsibilities

(1) A worker who is required to use personal protective equipment must

(a) use the equipment in accordance with training and instruction,

(b) inspect the equipment before use,

(c) refrain from wearing protective equipment outside of the work area where it is required if to do so would constitute a hazard, and

(d) report any equipment malfunction to the supervisor or employer.

(2) A worker who is assigned responsibility for cleaning, maintaining or storing personal protective equipment must do so in accordance with training and instruction provided.

8.10 Personal clothing and accessories

(1) The personal clothing of a worker must be of a type and in a condition which will not expose the worker to any unnecessary or avoidable hazards.

(2) If there is a danger of contact with moving parts of machinery or with electrically energized

equipment, or if the work process presents similar hazards

(a) the clothing of the worker must fit closely about the body,

(b) dangling neckwear, bracelets, wristwatches, rings or similar articles must not be worn, except for medical alert bracelets which may be worn with transparent bands that hold the bracelets snugly to the skin, and

(c) cranial and facial hair must be confined, or worn at a length which will prevent it from being snagged or caught in the work process.

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Safety Headgear

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8.11 General requirement

(1) Safety headgear must be worn by a worker in any work area where there is a danger of head injury from falling, flying or thrown objects, or other harmful contacts.

(2) Safety headgear must meet the requirements of

(a) *CSA Standard CAN/CSA-Z94.1-92, Industrial Protective Headwear*,

(b) *ANSI Standard Z89.1-1986, American National Standard for Personnel Protection - Protective Headwear for Industrial Workers Requirements,* or

(c) *Japanese Industrial Standard JIS T8131-1990, Industrial Safety Helmets,* for Class AB or ABE headgear.

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

(3) If a worker may be exposed to an electrical hazard the safety headgear must have an appropriate non-conductive rating.

(4) Chin straps or other effective means of retention must be used on safety headgear when workers are climbing or working from a height exceeding 3 m (10 ft), or are exposed to high winds or other conditions that may cause loss of the headgear.

(5) Repealed. [B.C. Reg. 381/2004, effective January 1, 2005.]

(6) Damaged headgear or headgear with missing, mismatched, or modified components must be removed from service.

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

8.12 Use with all-terrain vehicles, snowmobiles, motorcycles

(1) Operators and passengers on all-terrain vehicles, snowmobiles and motorcycles must wear headgear meeting the requirements of

(a) *CSA Standard CAN3-D230-M85, Protective Headgear in Motor Vehicle Applications*,

(b) *British Safety Institution Standard BS5361.1976, Specification: Protective Helmets for Vehicle Users, (as amended to 1981),*

(c) *Snell Memorial Foundation 1995 Standard for Protective Headgear for Use with Motorcycles and Other Motorized Vehicles,* or

(d) *US Federal Standard for Motorcycle Helmets (Title 49 - Transportation - Part 571.218).*

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

* See section 4.4 of the OHS Regulation.

(2) Headgear in good condition meeting earlier editions of a standard listed in subsection (1) may remain in service if purchased before April 15, 1998.

(3) When an all-terrain vehicle is operated within a specific location, with no significant hazard of rollover or loss of control and at a speed not exceeding 20 km/h (13 mph), safety headgear meeting the requirements of section 8.13 may be used in place of headgear specified in subsection 8.12(1).

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

8.13 Use with bicycles and skates

(1) A worker riding a bicycle or using in-line skates or similar means of transport must wear headgear meeting the requirements of

(a) *CSA Standard CAN/CSA-D113.2-M89, Cycling Helmets*,

(b) *Snell Memorial Foundation 1994 Standard for Protective Headgear for Use in Non-Motorized Sports,* or

(c) *Snell Memorial Foundation 1995 Standard for Protective Headgear for Use in Bicycling.*

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

(2) If a bicycle or similar conveyance is operated at speeds not exceeding 20 km/h (13 mph) within a specific location, safety headgear meeting the requirements of section 8.11 is acceptable when worn with a chin strap.

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

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Eye and Face Protection

8.14 Safety eyewear

(1) A worker must wear properly fitting safety eyewear appropriate to the conditions of the workplace if handling or exposed to materials which are likely to injure or irritate the eyes.

(2) Properly fitting safety eyewear appropriate to the conditions of the workplace must be worn if a worker

(a) has 20/200 or less vision in either eye, or is blind in either eye, or

(b) is working on or testing electrical equipment energized at a potential greater than 30 volts.

8.15 Prescription safety eyewear

(1) Prescription safety eyewear must meet the requirements of *CSA Standard CAN/CSA-Z94.3-92, Industrial Eye and Face Protectors*.

(2) Bifocal and trifocal glass lenses must not be used if there is danger of impact unless they are worn behind impact rated goggles or other eye protection acceptable to the Board.

(3) If the use of polycarbonate or plastic prescription lenses is impracticable, due to the conditions of the workplace, and there is no danger of impact, workers may use prescription lenses made of treated safety glass meeting the requirements of *ANSI Standard Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection*.

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

* See also section 4.4 of the OHS Regulation.

8.16 Sideshields

Safety eyewear must be fitted with sideshields when necessary for the safety of a worker.

8.17 Face protection

(1) If there is a risk of face injury, suitable face protection must be worn.

(2) Face protectors and non-prescription safety eyewear must meet the requirements of

(a) *CSA Standard CAN/CSA-Z94.3-92, Industrial Eye and Face Protectors*, or

(b) *ANSI Standard Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection.*

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

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

8.18 Contact lenses

Adequate precautions must be taken if a hazardous substance or condition may adversely affect a worker wearing contact lenses.

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8.19 General requirement

(1) The employer must provide appropriate skin, hand, foot or body protection if a worker is exposed to a substance or condition which is likely to puncture, abrade or otherwise adversely affect the skin, or be absorbed through it.

(2) If there is a danger of injury, contamination or infection to a worker's hands, arms, legs, or torso, the worker must wear properly fitting protective equipment appropriate to the work being done and the hazards involved.

8.20 Cleaning or replacement

If a glove, apron, or other protective equipment used to protect the skin against contact with a hazardous substance is rendered ineffective due to contamination with the substance, the protective equipment must be promptly replaced with clean or decontaminated equipment to maintain the required protection.

8.21 Leg protection

(1) Leg protective devices must be worn by a worker operating a chain saw.

(2) Leg protective devices referred to in subsection (1) must meet or exceed

(a) the general requirements of section 4 of the *WorkSafeBC Standard - Leg Protective Devices,* as set out in Schedule 8-A of this Part, and

(b) the performance requirements of one of the following standards, using the cut-resistance testing protocol set out in that standard except as varied in subparagraph (ii):

(i) *WorkSafeBC Standard - Leg Protective Devices*, as set out in section 5 of Schedule 8-A of this Part, applying a threshold chain speed of 18.3 metres per second or 3 600 feet per minute;

(ii) *ASTM F 1414-04 Standard Test Method for Measurement of Cut Resistance to Chain Saw in Lower Body (Legs) Protective Clothing*, but applying a threshold chain speed of 16.8 metres per second or 3 300

feet per minute;

(iii) *ISO 11393-2 Protective clothing for users of hand-held chain-saws - Part 2: Test methods and performance requirements for leg protectors*, applying a Class 2 threshold chain speed of 24 metres per second or 4 724 feet per minute;

(iv) *BS EN 381-5:1995 Protective clothing for users of hand-held chain saws - Part 5: Requirements for leg protectors*, applying a Class 2 threshold chain speed of 24 metres per second or 4 724 feet per minute.

(3) A leg protective device worn by a worker must have a label that

(a) is permanently affixed,

(b) uses lettering that is at least 6 mm (1/4 in) high, and

(c) clearly indicates all of the following information:

(i) the name or trademark of the manufacturer;

(ii) the standard met or exceeded under subsection (2) (a);

(iii) the standard met or exceeded under subsection (2) (b);

(iv) the year of manufacture of the device unless otherwise marked on the device.

(4) The requirement to wear leg protective devices does not apply to a firefighter using a chain saw at the scene of a structural fire.

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

SCHEDULE 8-A

(*section 8.21 [leg protection]*)

WORKSAFEBC STANDARD — LEG PROTECTIVE DEVICES

1 Scope

This standard provides specifications and performance criteria for leg protection for a worker using a chain saw.

2 Definition

In this standard, *"leg protection"* or *"leg protective device"* means personal protective equipment worn for protection from leg injury due to contact with a moving saw chain.

3 Types of leg protection

Leg protection must be of one of the following types:

(a) pant type: the protective pad is secured to and held in position by the trousers;

(b) apron type: the protective pad is secured to an apron style garment normally worn outside the trousers and secured around the worker's legs and waist;

(c) chap type: the protective pad is secured to a chap style garment normally worn outside the trousers and secured around the worker's legs.

4 General requirements

(1) Leg protection must be of materials suitable for the intended application.

(2) Leg protection

(a) must not unduly restrict the manoeuvrability of the worker, and

(b) must not shrink more than 10% when cleaned in accordance with the manufacturer's instructions during its service life.

(3) The protective pad of leg protection must be at least 711 mm (28 in) long and of a width covering 180° in the front of both legs from inseam to outseam plus 100 mm (4 in) on the left side of both legs.

(4) If the length requirement in subsection (3) results in a tripping hazard, the protective pad may be shorter, as long as it meets the requirements set out in subsection (5).

(5) When leg protection is worn by a worker, the protective pad

(a) must extend at minimum from the crotch to within 75 mm (3 in) of the ankle, and

(b) must be effectively secured in this position.

(6) Effective measures must be taken to prevent unravelling or fraying of material along any edges or other area of leg protection where unravelling or fraying is likely to occur.

(7) A heat seal used to control unravelling or fraying of synthetic fibres of leg protection

(a) must be effective over the life of the product, and

(b) if subject to cracking, must be covered to prevent abrasion of the worker's skin.

(8) Instructions on the proper care, maintenance and repair of leg protection must be provided by the manufacturer.

(9) Leg protection showing damage that will affect its performance must be removed from service.

5 Cut-resistance testing protocol and performance requirements

(1) Leg protection must meet or exceed the "threshold chain speed test" in which the protective pad must be able to consistently resist being cut-through by a running saw chain operating at a speed of 1 098 m/min (3 600 ft/min) or more for at least 1.01 seconds.

(2) Threshold chain speed tests must be conducted

(a) on leg protection samples assembled in the manner in which the leg protection will be produced for distribution, and

(b) using the test apparatus described in subsection (3) in accordance with the procedures and methodology described in this section.

(3) The test apparatus to be used in conducting a threshold chain speed test must include a simulated "leg", chain saw and instruments as follows:

(a) a simulated "leg" (see Figure 1) that is

(i) made of wood approximately 150 mm (6 in) in diameter with a 20 mm (¾ in) layer of resilient covering (Ensolite or similar material) attached to simulate the resilience of flesh,

(ii) designed to allow the leg protection to be mounted and tested similar to the configuration the leg protection will take when worn by a worker while the worker's leg is extended, and

(iii) mounted to allow rotation about the longitudinal axis of up to 75 mm (3 in) at the outer circumference, against an applied torque of at least 1.7 Newton-metres (15 inch pounds) and which torque may increase as the leg rotates;

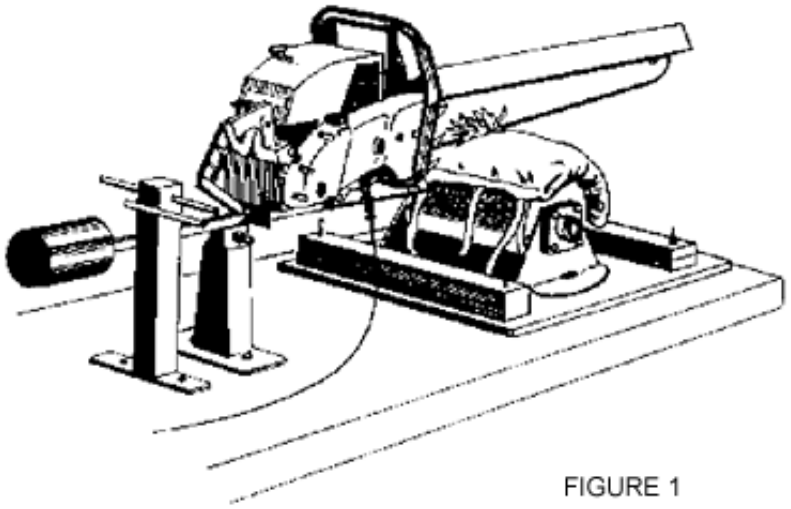

FIGURE 1

(b) a chain saw, with Oregon 72 LP chisel chain and capable of a chain speed of at least 1 220 m/min (4 000 ft/min), that must pivot in a vertical plane to contact the "leg" (see Figure 1) with a downward force of 50 ± 1 Newtons (11 ± 0.1 lb);

(c) instruments to measure and record chain speed and cut-through time.

(4) The test procedure and methodology are as follows:

(a) start the saw and set the chain speed to the constant level selected for the test cut;

(b) allow the bottom of the running saw chain to freefall 6 mm (¼ in) onto the test specimen mounted on the "leg";

(c) record the time from contact of the saw chain with the test specimen to the nearest 0.01 second;

(d) record the chain speed during each test;

(e) repeat the tests on the same material until the maximum chain speed (± 15 m/min or ± 50 ft/min) at which cut-through does not occur for at least 1.01 seconds or more is determined;

(f) maintain the chain saw in good repair throughout the testing and keep the saw cutters sharp in accordance with the saw chain manufacturer's recommendations.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

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Footwear

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8.22 General requirement

(1) A worker's footwear must be of a design, construction, and material appropriate to the protection required.

(2) To determine appropriate protection under subsection (1) the following factors must be considered: slipping, uneven terrain, abrasion, ankle protection and foot support, crushing potential, temperature extremes, corrosive substances, puncture hazards, electrical shock and any other recognizable hazard.

(3) If a determination has been made that safety protective footwear is required to have toe protection, metatarsal protection, puncture resistant soles, dielectric protection or any combination of these, the footwear must meet the requirements of

(a) *CSA Standard CAN/CSA-Z195-M92, Protective Footwear*,

(b) *ANSI Standard Z41-1991, American National Standard for Personal Protection - Protective Footwear,*

(c) *British Safety Institution Standard BS EN 345:1993 Specification for Safety Footwear for Professional Use,* or

(d) *British Safety Institution Standard BS EN 346:1993 Specification for Protective Footwear for Professional Use.*

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

(4) A worker must wear the appropriate footwear and ensure that it is in a condition to provide the required protection.

(5) If it is not practicable for workers in the performing arts to wear safety footwear meeting the requirements of subsection (3) other effective measures must be taken for protection from injury.

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

8.23 Slippery surfaces

(1) If a workplace has slippery surfaces, appropriate non-slip footwear must be worn.

(2) Caulked or other equally effective footwear must be worn by workers who are required to walk on logs, poles, pilings or other round timbers.

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8.24 High visibility apparel

(1) Repealed. [B.C. Reg. 242/2006, effective January 1, 2007.]

(2) A worker exposed to the hazards of vehicles travelling at speeds in excess of 30 km/h (20 mph) must wear high visibility apparel meeting the Type 1 or Type 2 criteria of *WCB Standard Personal Protective Equipment Standard 2-1997, High Visibility Garment*.

(3) A worker whose duties on the work site result in exposure to the hazards of mobile equipment must wear high visibility apparel meeting at least the Type 3 criteria of *WCB Standard Personal Protective Equipment Standard 2-1997, High Visibility Garment*.

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

[Amended by B.C. Reg. 242/2006, effective January 1, 2007.]

8.25 Distinguishing apparel

If distinguishing apparel is required in another Part of this Regulation for the purpose of identifying a worker's location or well-being, the apparel must be of a colour which contrasts with the environment and must have at least 775 sq cm (120 sq in) of fluorescent trim for daytime use and retroreflective trim for nighttime use, on both the front and back.

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8.26 When required

(1) A worker who is employed under conditions which involve a risk of drowning must wear a personal flotation device (PFD) or lifejacket with sufficient buoyancy to keep the worker's head above water.

(2) Subsection (1) does not apply if other acceptable safety measures are in place which will protect workers from the risk of drowning, or the water is too shallow to allow the lifejacket or PFD to function effectively.

(3) A personal flotation device need not be worn when a personal fall protection system, guardrail or safety net is being used in accordance with the relevant requirements in Part 11 (Fall Protection) to prevent a fall into the water.

8.27 Compliance with standards

Buoyancy equipment must be labelled and otherwise meet the requirements of

(a) *CGSB Standard CAN/CGSB-65.7-M88, Lifejackets, Inherently Buoyant Type* with a minimum buoyancy of 93 N (21 lbs),

(b) *CGSB Standard CAN/CGSB-65.11-M88, Personal Flotation Devices* with a minimum buoyancy of 69 N (15.5 lbs),

(c) *CGSB Standard 65-GP-14M, Lifejackets, Inherently Buoyant, Standard Type* with a minimum buoyancy of 125 N (28 lbs), or

(d) *British Safety Standard BS EN 396-1994, Lifejackets and Personal Buoyancy Aids - Lifejacket 150 N,* automatically inflatable units with a minimum buoyancy of 150 N (34 lbs).

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

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

* See section 4.4 of the OHS Regulation.

8.28 Working alone

If a worker working alone is exposed to risk of drowning, the worker must wear a lifejacket meeting the requirements of section 8.27(a), (c) or (d).

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

8.29 Automatically inflatable lifejackets

If automatically inflatable lifejackets are used, the employer must keep a record of all inspections made and maintenance performed on them.

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

* See also section 4.3 of the OHS Regulation.

8.30 Retroreflective material

Personal flotation devices and lifejackets must have at least 200 sq cm (32 sq in) of white or silver retroreflective material fitted on surfaces that are normally above the water surface.

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

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8.31 When required

Workers must wear flame resistant clothing appropriate to the risk if working in areas where they may be exposed to flash fires, molten metal, welding and burning or similar hot work hazards.

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8.32 When respirator required

If a worker is or might be exposed in a workplace to an air contaminant that exceeds

(a) an 8-hour TWA limit, ceiling limit or short-term exposure limit set by ACGIH for the air contaminant,

(b) a limit that is otherwise determined by the Board under section 5.48 for the air contaminant, or

(c) a limit set by section 5.49 for the air contaminant,

the employer must provide an appropriate respirator and ensure that the worker uses an appropriate respirator in accordance with section 8.34.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

8.33 Selection

(1) The employer, in consultation with the worker and the occupational health and safety committee, if any, or the worker health and safety representative, if any, must select an appropriate respirator in accordance with *CSA Standard CAN/CSA-Z94.4-93, Selection, Use, and Care of Respirators*.

(2) Only a respirator which meets the requirements of a standard acceptable to the Board may be used for protection against airborne contaminants in the workplace.

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

8.34 Maximum use concentration

(1) In subsection (2):

"established 8-hour TWA limit" means the 8-hour TWA limit set by the Board for an air contaminant, or if the Board has not set an 8-hour TWA limit for an air contaminant, the TWA limit set by ACGIH for the air contaminant;

"established ceiling limit" means a ceiling limit set by the Board for an air contaminant, or if the Board has not set a ceiling limit for an air contaminant, the ceiling limit set by ACGIH for the air contaminant;

"established short-term exposure limit" means the short-term exposure limit set by the Board for an air contaminant, or if the Board has not set a short-term exposure limit for an air contaminant, the short-term exposure limit set by ACGIH for the air contaminant.

(2) In subsection (3), *"maximum use concentration"* means the concentration of an air contaminant calculated in one of the following ways:

(a) if an established 8-hour TWA limit applies to the air contaminant to which a worker is or might be exposed, by multiplying

(i) the established 8-hour TWA limit for the air contaminant, and

(ii) the protection factor set out in Table 8-1 that applies to the respirator type that the worker is using;

(b) if there is no established 8-hour TWA limit that applies to the air contaminant to which a worker is or might be exposed, by multiplying

(i) the established short-term exposure limit for that air contaminant, and

(ii) the protection factor set out in Table 8-1 that applies to the respirator type that the worker is using;

(c) if there is no established 8-hour TWA limit or short-term exposure limit that applies to the air contaminant to which a worker is or might be exposed, by multiplying

(i) the established ceiling limit for that air contaminant, and

(ii) the protection factor set out in Table 8-1 that applies to the respirator type that the worker is using.

(3) The employer must ensure that a worker does not use a respirator for protection against a concentration of an air contaminant in the workplace that is greater than the maximum use concentration.

(4) The protection factor of 1 000 set out in Table 8-1: Respirator protection factors for a hood or helmet facepiece, powered (PAPR), and equipped with a HEPA filter or a sorbent cartridge or canister or both a HEPA filter and a sorbent cartridge or canister applies only if an employer who uses or wishes to use that

respirator type has evidence from the manufacturer that demonstrates that

(a) the manufacturer has tested that type of respirator, and

(b) those tests demonstrate that a respirator of that type has a protection factor of at least 1 000.

(5) The protection factor of 25 set out in Table 8-1: Respirator protection factors for a hood or helmet facepiece, powered (PAPR), and equipped with a HEPA filter or a sorbent cartridge or canister or both a HEPA filter and a sorbent cartridge or canister applies if the conditions set out in subsection (4) are not met.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

Table 8-1: Respirator protection factors

Respirator type	Protection Factor
Air purifying	
Half facepiece, non-powered	10
Full facepiece, non-powered	50
Full facepiece, powered (PAPR), equipped with HEPA filters for exposure to asbestos	100
Full facepiece, powered (PAPR), equipped with HEPA filters and/or sorbent cartridge or canister for exposure to contaminants other than asbestos	1 000
Loose-fitting facepiece, powered (PAPR)	25
Hood or helmet facepiece, powered (PAPR), and equipped with a HEPA filter or a sorbent cartridge or canister or both a HEPA filter and a sorbent cartridge or canister, if section 8.34 (5) applies	25
Hood or helmet facepiece, powered (PAPR), and equipped with a HEPA filter or a sorbent cartridge or canister or both a HEPA filter and a sorbent cartridge or canister, if the conditions set out in section 8.34 (4) are met	1 000
Air supplying	
Airline - demand (negative pressure)	
Half facepiece	10
Full facepiece	50
Airline - continuous flow	
Loose-fitting facepiece/hoods	25
Half facepiece	50
Full facepiece	1 000
Helmet/hood	1 000
Airline - pressure demand (positive pressure)	
Half facepiece	50
Full facepiece	1 000

Full facepiece, with egress bottle	10 000
Self-contained breathing apparatus (SCBA)	
Demand (negative pressure)	50
Pressure demand (positive pressure)	10 000
Other factors such as warning properties, IDLH levels, and cartridge/canister limitations must also be taken into account when determining the maximum use concentration. Refer to the manufacturer's instructions and standards acceptable to the Board for further information.	

[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

8.35 IDLH or oxygen deficient atmosphere

(1) If a worker is required to enter or work in an IDLH or oxygen deficient atmosphere the worker must

(a) wear a full facepiece positive pressure respirator which is either an SCBA, or an airline respirator with an auxiliary self- contained air cylinder of sufficient capacity to permit the worker to escape unassisted from the contaminated area if the air supply fails, and

(b) be attended by at least one other worker stationed at or near the entrance to the contaminated area who is similarly equipped and capable of effecting rescue.

(2) Subsection (1)(a) applies if there is a significant risk of accidental release into a worker's breathing zone of quantities of an air contaminant sufficient to produce an IDLH atmosphere.

8.36 Emergency escape respirators

(1) If the nature or quantity of an air contaminant and the nature of the work area could prevent a worker escaping from a contaminated area without assistance, the worker must carry an emergency escape respirator.

(2) The emergency escape respirator must be

(a) carried on the worker's person or be within arm's reach at all times, and

(b) sufficient to permit the worker to leave the contaminated area without assistance.

8.37 Respirable air quality

(1) Compressed breathing air supplied for equipment such as an SCBA and a supplied air respirator must be tested at least annually to ensure that the air being supplied meets the requirements of *CSA Standard CAN/CSA-Z180.1-00, Compressed Breathing Air and Systems*.

(2) If an SCBA cylinder has not been used for a period in excess of one year, air in the cylinder must be slowly depressurized to atmosphere and refilled with compressed breathing air that meets the requirements of *CSA Standard CAN/CSA-Z180.1-00, Compressed Breathing Air and Systems*.

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

[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

8.38 Corrective eyewear

(1) If a worker who wears prescription eyeglasses is required to wear a full facepiece respirator, the employer must assess the work to be performed, and provide appropriate specialty corrective eyewear if necessary to ensure that the work can be performed safely.

(2) The employer may permit the use of contact lenses by a worker who is required to wear a full facepiece respirator if their use is not likely to adversely affect the health or safety of the worker.

8.39 Face seal

(1) Except for specialty eyewear approved by the Board for use with positive pressure full facepiece respirators, nothing is permitted which intrudes between the facepiece and the face, or which interferes with the face seal of the facepiece.

(2) A worker required to wear a respirator which requires an effective seal with the face for proper functioning must be clean shaven where the respirator seals with the face.

8.40 Fit tests

(1) A respirator which requires an effective seal with the face for proper functioning must not be issued to a worker unless a fit test demonstrates that the facepiece forms an effective seal with the wearer's face.

(2) Fit tests must be performed in accordance with procedures in *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

(2.1) A fit test must be carried out

(a) before initial use of a respirator,

(b) at least once a year,

(c) whenever there is a change in respirator facepiece, including the brand, model, and size, and

(d) whenever changes to the user's physical condition could affect the respirator fit.

(3) Other personal protective equipment that is to be worn at the same time as a respirator and which could interfere with the respirator fit must be worn during a fit test.

(4) Repealed. [B.C. Reg. 20/2006, effective May 17, 2006.]

[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

8.41 User seal check

(1) Before each use of a respirator which requires an effective seal with the face for proper functioning, a

worker must perform a positive or negative pressure user seal check in accordance with *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

(2) Subsection (1) does not apply to the emergency use of an escape respirator.

[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

8.42 Medical assessment

If a worker is required to use a respirator and there is doubt about the worker's ability to use a respirator for medical reasons, the worker must be examined by a physician, and the examining physician must be provided with sufficient information to allow the physician to advise the employer of the ability of the worker to wear a respirator.

8.43 Optional use

In circumstances where section 8.32 does not apply, and either an employer chooses to provide a respirator to a worker or the worker chooses to use a personal respirator, then the requirements of sections 8.3, 8.7 and 8.33(2) apply.

8.44 Records

The employer must maintain a record of

(a) fit test results and worker instruction,

(b) maintenance for air supplying respirators, powered air purifying respirators, and for sorbent cartridges and canisters, and

(c) maintenance and repairs for each self-contained breathing apparatus and all air cylinders in accordance with the requirements of *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

8.45 Maintenance and inspections

(1) Inspection of compressed air cylinders must be done in accordance with *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

(2) Self-contained breathing apparatus, including regulators, must be serviced and repaired by qualified persons.

(3) Compressed air cylinders must be hydrostatically tested in accordance with *CSA Standard CAN/CSA-B339-96, Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods*.

[Enacted by B.C. Reg. 20/2006, effective May 17, 2006.]

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Part 9 Confined Spaces

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Confined Spaces Definitions

9.1 Definitions

In this Part

"adjacent piping" means a device such as a pipe, line, duct or conduit which is connected to a confined space or is so located as to allow a substance from within the device to enter the confined space;

"blank" means a solid plate installed through the cross-section of a pipe, usually at a flanged connection;

"blanking or blinding" means the absolute closure of adjacent piping, by fastening across its bore a solid plate or cap that completely covers the bore and that is capable of withstanding the maximum pressure of the adjacent piping;

"blind" means a solid plate installed at the end of a pipe which has at that point been physically disconnected from a piping system;

"clean respirable air" when used to describe the atmosphere inside a confined space, means an atmosphere which is equivalent to clean, outdoor air and which contains

(a) about 20.9% oxygen by volume,

(b) no measurable flammable gas or vapour as determined using a combustible gas measuring instrument, and

(c) no air contaminant in concentrations exceeding either 10% of its applicable exposure limit in Part 5 (Chemical Agents and Biological Agents) or an acceptable ambient air quality standard established by an authority having jurisdiction over environmental air standards, whichever is greater;

"confined space", except as otherwise determined by the Board, means an area, other than an underground working, that

(a) is enclosed or partially enclosed,

(b) is not designed or intended for continuous human occupancy,

(c) has limited or restricted means for entry or exit that may complicate the provision of first aid, evacuation, rescue or other emergency response service, and

(d) is large enough and so configured that a worker could enter to perform assigned work;

"disconnecting" means physically disconnecting adjacent piping from a confined space to prevent its

contents from entering the space in the event of discharge;

"double block and bleed" means the closure of adjacent piping by locking out a drain or vent in the open position in the line between 2 locked out valves in the closed position;

"harmful substance" means a WHMIS hazardous product, a substance referred to under section 5.48, or a substance which may have a harmful effect on a worker in a confined space;

"high hazard atmosphere" means an atmosphere that may expose a worker to risk of death, incapacitation, injury, acute illness or otherwise impair the ability of the worker to escape unaided from a confined space, in the event of a failure of the ventilation system or respirator;

"inerting" means intentionally flooding the atmosphere inside a confined space with an inert gas such as nitrogen to eliminate the hazard of ignition of flammable vapours inside the confined space but thereby creating an oxygen deficient atmosphere;

"low hazard atmosphere" means an atmosphere which is shown by pre-entry testing or otherwise known to contain clean respirable air immediately prior to entry to a confined space and which is not likely to change during the work activity, as determined by a qualified person after consideration of the design, construction and use of the confined space, the work activities to be performed, and all engineering controls required by this Regulation;

"moderate hazard atmosphere" means an atmosphere that is not clean respirable air but is not likely to impair the ability of the worker to escape unaided from a confined space, in the event of a failure of the ventilation system or respirator.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

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

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

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9.2 Initial determination

The employer must

(a) ensure that each confined space in the workplace is identified, and

(b) determine whether any such space will require entry by a worker, either in scheduled work activities or as a result of foreseeable system failures or other emergencies.

9.3 Prohibited entry

If a confined space exists at a workplace but no worker entry is required, the employer must ensure that each point of access to the confined space is secured against entry or identified by a sign or other effective means which indicates the nature of the hazard and the prohibition of entry, and that workers are instructed not to enter.

9.4 Control of hazards

The employer must ensure that all confined space hazards are eliminated or minimized and that work is performed in a safe manner.

9.5 Confined space entry program

Before a worker is required or permitted to enter a confined space, the employer must prepare and implement a written confined space entry program which includes

(a) an assignment of responsibilities,

(b) a list of each confined space or group of similar spaces and a hazard assessment of those spaces, and

(c) written safe work procedures for entry into and work in the confined space, that address, where applicable

(i) identification and entry permits,

(ii) lockout and isolation,

(iii) verification and testing,

(iv) cleaning, purging, venting or inerting,

(v) ventilation,

(vi) standby persons,

(vii) rescue,

(viii) lifelines, harnesses and lifting equipment,

(ix) personal protective equipment and other precautions, and

(x) coordination of work activities.

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9.6 Administration

The employer must assign overall responsibility for administration of the confined space entry program to a person or persons adequately trained to do so.

9.7 Supervision

(1) The employer must assign responsibility for supervision to a person who is adequately trained to supervise the job before any worker enters a confined space.

(2) The responsible supervisor must ensure that

(a) pre-entry testing and inspection is conducted based on the written procedures,

(b) the precautions identified in the written procedures and the precautions required by this Regulation or which are otherwise necessary for the health and safety of workers are followed, and

(c) only authorized workers enter a confined space.

9.8 Instruction

Each person who is assigned duties or responsibilities related to entry into a confined space must be adequately instructed and trained in

(a) the hazards of the space, and

(b) the precautions identified in written procedures to properly perform their duties.

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9.9 Hazard Assessment

(1) A hazard assessment must be conducted for each

(a) confined space, or each group of confined spaces which share similar characteristics, and

(b) work activity, or group of work activities which present similar hazards, to be performed inside a confined space.

(2) The hazard assessment required by subsection (1) must consider

(a) the conditions which may exist prior to entry due to the confined space's design, location or use, or which may develop during work activity inside the space, and

(b) the potential for oxygen enrichment and deficiency, flammable gas, vapour or mist, combustible dust, other hazardous atmospheres, harmful substances requiring lockout and isolation, engulfment and entrapment, and other hazardous conditions.

9.10 Procedures

Written procedures specifying the means to eliminate or minimize all hazards likely to prevail must be developed, based on the hazard assessment required by section 9.9.

9.11 Qualifications

(1) The hazard assessment and written confined space entry procedures must be prepared

(a) by a qualified person who has adequate training and experience in the recognition, evaluation and control of confined space hazards, and

(b) in consultation with the person assigned overall responsibility for administration of the confined space entry program and with the joint committee or the worker health and safety representative, as applicable.

(2) For the purposes of subsection (1)(a) qualifications which are acceptable as evidence of adequate training and experience include

(a) certified industrial hygienist (CIH), registered occupational hygienist (ROH), certified safety professional (CSP), Canadian registered safety professional (CRSP) or professional engineer (P. Eng.), provided that the holders of these qualifications have experience in the recognition, evaluation and control of confined space hazards, or

(b) Repealed. [B.C. Reg. 243/2006, effective January 1, 2007.]

(c) other combination of education, training and experience acceptable to the Board.

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

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9.12 Identification

When a confined space requires entry by a worker, each point of access which is not secured against entry must be identified by a sign or other effective means which indicates the hazard and prohibits entry by unauthorized workers.

9.13 When permits required

(1) An entry permit must be completed and signed by the responsible supervisor before a worker enters a confined space

(a) with a high hazard atmosphere,

(b) that requires lockout or isolation procedures to be followed, or

(c) in which there is a hazard of entrapment or engulfment.

(2) An entry permit must be posted at each designated point of entry to a confined space.

(3) Subsection (2) does not apply if

(a) the entry permit is posted at a minimum of one designated point of entry,

(b) the identification at other designated points of entry includes up-to-date information on whether it is safe to enter, and

(c) all workers authorized to enter are informed of the location of posted entry permits.

9.14 Contents of permit

An entry permit must identify the

(a) confined space and the work activities to which it applies,

(b) workers who are inside the space,

(c) required precautions for the space, and

(d) time of expiration of the permit.

9.15 Updating the information

(1) Once issued, the information on an entry permit may only be altered by

(a) the responsible supervisor who signed the permit to update it in accordance with subsection (2) or (3),

(b) the standby worker to update the list of workers inside the confined space, or

(c) the tester to record test results.

(2) An entry permit must be reviewed and updated as necessary to ensure the ongoing safety of the workers inside the space.

(3) The permit must be re-authorized and signed by the responsible supervisor

(a) if there is a change in the work crew,

(b) after each shift change, or

(c) after a change of the responsible supervisor.

(4) Every worker affected must be informed of an alteration of an entry permit regarding a change in the required precautions or work activity.

9.16 Record of permit

A copy of the signed entry permit must be kept for at least one year.

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9.17 Lockout

Before a worker enters a confined space, any material conveyance equipment that transports material to or from the space must be free of material if the material could present a hazard.

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

* See also Part 10 (De-energization and Lockout) of the OHS Regulation.

9.18 Control of harmful substance in adjacent piping

(1) Before a worker enters a confined space where adjacent piping contains a harmful substance that is

(a) a liquid with sufficient volatility to produce a hazardous concentration of an air contaminant, or

(b) a gas or vapour,

the harmful substance in the adjacent piping must be controlled by either disconnecting the adjacent piping or isolating it using blanks or blinds that meet the requirements of section 9.20.

(2) Subject to subsection (3), before a worker enters a confined space where adjacent piping contains a harmful substance that is neither

(a) a liquid with sufficient volatility to produce a hazardous concentration of an air contaminant, nor

(b) a gas or vapour,

the harmful substance in the adjacent piping must be controlled by either disconnecting the adjacent piping or isolating it using blanks or blinds that meet the requirements of section 9.20 or using a double block and bleed system that meets the requirements of section 9.21.

(3) Before a worker enters a confined space where adjacent piping contains a substance that is harmful only because of the temperature, pressure or quantity of the substance, the harmful substance must be controlled

(a) by either disconnecting the adjacent piping or isolating it using blanks or blinds that meet the requirements of section 9.20 or using a double block and bleed system that meets the requirements of section 9.21,

(b) by isolating the adjacent piping in a manner that a professional engineer has certified will make the confined space safe for a worker to carry out the intended work, or

(c)if there is no head pressure in the adjacent piping, by de-energizing and locking out each pressure source for the adjacent piping and depressurizing the adjacent piping.

(4) Where a confined space is

(a) subject to the ingress of gases from a gravity-flow municipal or domestic sanitary sewer system or storm sewer system, and

(b) protected from the ingress of gases by a p-trap,

a worker may enter the confined space only if the atmosphere of the confined space has been tested immediately before entry and the test results confirm that the confined space contains clean respirable air.

(5) If a worker enters a confined space of the type referred to in subsection (4), the following must be undertaken:

(a) the operational integrity of the p-trap must be confirmed immediately on the entry of the worker;

(b) while the worker is inside the confined space, the atmosphere of the confined space must be continuously monitored and confirmed to contain clean respirable air.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

9.18.1 Exemptions

Repealed. [B.C. Reg. 312/2010, effective February 1, 2011.]

9.19 Isolation points

(1) The employer must keep a record which identifies the location of every isolation point.

(2) Every isolation point must be visually checked or otherwise verified to ensure that the confined space is effectively isolated before a worker enters the space.

9.20 Blanks and blinds

(1) Unless certified by a professional engineer to provide adequate safety for the particular conditions of anticipated pressure, temperature and service, a blank or blind must be manufactured in accordance with the specifications of one of the following standards:

(a) *ANSI Standard API 590-1985, Steel Line Blanks;*

(b) *ANSI Standard ASME/ANSI B16.5-1988, Pipe Flanges and Flanged Fittings;*

(c) *ANSI Standard ASME B31.1-1992, Power Piping;*

(d) *ANSI Standard ASME B31.3-1993, Chemical Plant and Petroleum Refinery Piping.*

(2) If a blank or blind is certified by a professional engineer, the employer must keep a record of its certification, location and conditions of service.

(3) If required, an allowance for corrosion must be made in the design of a blank or a blind.

(4) A blank or blind must be stamped with or otherwise indicate its pressure rating.

(5) If a line is to be opened for disconnection or to insert a blank or a blind, written safe work procedures must be prepared and followed to prevent hazardous exposure of workers to its contents.

(6) Visual indication that a blank or blind has been installed must be provided at the point of installation.

(7) If required to prevent leakage, gaskets must be installed on the pressure side of blanks or blinds and flanges must be tightened to make the blanks or blinds effective.

(8) If threaded lines are used, threaded plugs or caps must be used to blind the lines.

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

* See also section 4.4 of the OHS Regulation.

9.21 Double block and bleed

If a double block and bleed isolation system is used

(a) the diameter of the bleed line must be no less than the diameter of the line being isolated, unless certified by a professional engineer,

(b) the bleed for a liquid system must be at a lower elevation than the block valves,

(c) all valves must be locked out in their proper open or closed position,

(d) the downstream block valve must be checked to ensure that it is capable of safely withstanding the line pressure,

(e) the bleed must be checked to ensure that it remains clear of obstructions while the confined space is occupied, either by continuous automatic monitoring or by manually checking within 20 minutes before worker entry, or before re-entry after the confined space has been vacated for more than 20 minutes, and

(f) in the event of discharge from the bleed line resulting from failure of the upstream block valve, all workers must immediately exit the confined space and the space must be effectively re-isolated before a worker enters the space.

9.22 Alternative measures of control or isolation of adjacent piping

(1) Section 9.18 does not apply if

(a) a measure specified in section 9.18 to control or isolate harmful substances contained in adjacent piping from a confined space is not practicable, and

(b) the employer implements alternative measures of control or isolation that are acceptable to the Board.

(2) All workers affected by measures implemented under subsection (1) must be informed of the measures taken and instructed in any applicable work procedures.

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

9.23 Discharge area

The area of potential discharge from a disconnected line or from the bleed of a double block and bleed isolation system must be controlled to ensure that any accidental discharge will not present a hazard to workers.

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9.24 Verifying all precautions

Before a worker enters a confined space, pre-entry testing and inspection must be conducted to verify that the required precautions have been effective at controlling the identified hazards and that it is safe for a worker to enter.

9.25 Testing the atmosphere

(1) Except as stated in subsection (7), before a worker enters a confined space, the employer must ensure that the atmosphere in the confined space is tested in accordance with this section and section 9.26.

(2) The pre-entry testing must be

(a) conducted as specified in the written work procedures, and

(b) completed not more than 20 minutes before a worker enters a confined space.

(3) When all workers have vacated the confined space for more than 20 minutes, pre-entry testing, as required by subsection (1), must be repeated.

(4) While a worker is inside a confined space with a moderate or high hazard atmosphere, additional testing must be conducted as necessary to ensure the worker's continuing safety.

(5) Whenever practicable, continuous monitoring of the atmosphere must be done.

(6) If a worker enters a confined space with a moderate or high hazard atmosphere, the employer must continuously monitor the atmosphere if a flammable or explosive atmosphere in excess of 20% of the lower explosive limit could develop.

(7) Pre-entry atmospheric testing is not required in a confined space with a low hazard atmosphere if

(a) the location and control of the space ensures that a more hazardous atmosphere could not inadvertently develop,

(b) such testing is not required to verify the effectiveness of an isolation or other pre-entry control,

(c) prior representative sampling has demonstrated that the atmosphere within the space or group of similar spaces meets the low hazard atmosphere definition, and

(d) the written entry procedures do not require such testing.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

9.26 Procedures and equipment

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

(2) Each confined space test must be carried out by a qualified person who has training and experience to calibrate, operate and monitor testing equipment and interpret readings from the testing equipment.

(3) The test record must show the date and time of the test, the initials of the tester and the levels or condition found.

(4) Test results, other than continuous monitoring results, must be posted without delay at all points of entry to the confined space.

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

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

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9.27 Cleaning, purging and venting

(1) When practicable, the employer must ensure that a confined space to be entered contains clean respirable air.

(2) If a confined space is known, or shown by pre-entry testing to contain other than clean respirable air, the hazard must be controlled by cleaning, purging or venting the space and the atmosphere must be retested before a worker enters the space.

(3) The dead-ends of a line that has been isolated must be cleaned, purged or vented to remove any harmful substance which could present a hazard to a worker entering the confined space.

9.28 Risk control

If clean respirable air cannot be assured in a confined space before worker entry, the employer must ensure that

(a) all workers entering the space wear appropriate personal protective equipment including respirators when necessary

(b) the concentrations of flammable gases and vapours are maintained below 20% of the lower explosive limit, and

(c) if flammable or explosive gases, vapours or liquids are present, all sources of ignition are eliminated or adequately controlled.

9.29 Inerting

(1) The employer must notify the Board in writing, and submit a copy of the proposed work procedures, at least 7 days before a worker enters a confined space which has been inerted.

(2) The employer must follow any additional precautions that are prescribed by the Board after review of the notification.

(3) If a confined space has been inerted

(a) all entry precautions for high hazard atmospheres must be followed, except the requirement for continuous ventilation,

(b) every worker entering the confined space must be equipped with a supplied-air respirator meeting the requirements of Part 8 (Personal Protective Clothing and Equipment),

(c) all ignition sources must be controlled, and

(d) the atmosphere inside the confined space must remain inerted while workers are inside.

(4) Subsection (1) does not apply to entry for the purpose of performing emergency rescue duties.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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9.30 Continuous ventilation

Every confined space must be ventilated continuously while a worker is inside the space, except in

(a) an atmosphere intentionally inerted in accordance with section 9.29,

(b) a low hazard atmosphere controlled in accordance with section 9.31(2), or

(c) an emergency rescue, if ventilation is not practicable.

9.31 Low hazard atmospheres

(1) The employer must ensure that a minimum of 85 m^3/hr (50 cfm) of clean respirable air is supplied for each worker inside a confined space with a low hazard atmosphere, except as permitted in subsection (2).

(2) Continuous ventilation is not required in a confined space which has a low hazard atmosphere, if

(a) the atmosphere is continuously monitored and shown to contain clean respirable air, and

(b) the space has an internal volume greater than 1.8 m^3 (64 cu ft) per occupant, is occupied for less than 15 minutes, and the work inside the space generates no contaminants other than exhaled air.

9.32 Mechanical ventilation

(1) A ventilation system for the control of airborne contaminants in a confined space must be designed, installed and maintained in accordance with established engineering principles and must be specified in the written procedures.

(2) Ventilation equipment must be located and arranged so as to adequately ventilate every occupied area inside the confined space.

(3) If a contaminant is produced in a confined space, it must be controlled at the source by a local exhaust ventilation system if practicable, by general (dilution) ventilation, or by a combination of both.

(4) If practicable, a mechanical ventilation system for a confined space must be sufficient to maintain concentrations of airborne contaminants below the applicable exposure limits.

9.33 Natural ventilation

(1) If natural ventilation is relied upon for the control of airborne contaminants in a confined space, the rate of airflow through the space must be monitored and must be sufficient to maintain concentrations of airborne contaminants below the applicable exposure limits.

(2) Natural ventilation must not be used

(a) to ventilate a confined space that has a high hazard atmosphere, or

(b) if such ventilation could draw air other than clean respirable air into the confined space.

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9.34 Low hazard atmosphere

If a worker enters a confined space which contains a low hazard atmosphere

(a) another worker must be assigned as a standby person,

(b) there must be a continuous means of summoning the standby person,

(c) the standby person must check on the well-being of workers inside the space at least every 20 minutes, and

(d) the standby person must have a means to immediately summon rescue personnel.

9.35 Moderate hazard atmosphere

If a worker enters a confined space which contains a moderate hazard atmosphere

(a) another worker or workers must be assigned as the standby person(s),

(b) a standby person must be stationed at or near the entrance to the space,

(c) the standby person must visually observe or otherwise check the well-being of the worker(s) inside the space, as often as may be required by the nature of the work to be performed, but at least every 20 minutes,

(d) there must be a continuous means of summoning the standby person from inside the space, and

(e) the standby person must have a means to immediately summon rescue personnel.

9.36 High hazard atmosphere, engulfment or entrapment

If a worker enters a confined space which contains a high hazard atmosphere, a risk of engulfment or entrapment or with any other recognized serious health or safety hazard

(a) another worker or workers must be assigned as the standby person(s),

(b) the standby person(s) must be stationed at the entrance to the space and must continuously attend to the standby duties,

(c) the standby person(s) must visually observe or otherwise continuously monitor the well-being of the worker(s) inside the space,

(d) there must be a continuous means of summoning the standby person(s) from inside the space,

(e) the standby person(s) must be equipped and capable of immediately effecting rescue using lifting equipment if required, or otherwise performing the duties of rescue persons, and

(f) the standby person(s) must prevent the entanglement of lifelines and other equipment.

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9.37 Provision of rescue services

(1) The employer must provide for the services of rescue persons when a worker enters a confined space.

(2) If the rescue persons are employees of another firm, or an agency such as a fire department, there must be a written agreement detailing the services that are to be provided.

9.38 Equipment and training

(1) Every person assigned rescue duties must be properly equipped and adequately trained to carry out such duties.

(2) A practice drill must be conducted at least annually.

(3) Records of training and practice drills must be maintained by the employer of the rescue persons.

9.39 Notification

(1) Before a worker enters a confined space, the responsible supervisor or the standby person must notify rescue personnel of work in the space.

(2) The responsible supervisor or the standby person must notify rescue personnel when all workers have completed their work and exited from the space.

(3) If more than one confined space is to be entered at the same time, notification of rescue personnel to be on alert status at the commencement of work is adequate.

(4) Notification requirements in this section do not apply if the written agreement indicates that rescue personnel are available 24 hours each day.

9.40 Summoning rescue

The employer must ensure that rescue personnel monitor any signalling system that will be used to summon the rescue persons in the event of an emergency whenever they have been informed by the responsible supervisor or the standby person that a confined space entry is in progress.

9.41 Rescue procedures

(1) Rescue or evacuation from a confined space must be directed by a supervisor who is adequately trained in such procedures or a qualified rescue person.

(2) Effective voice communication must be maintained at all times between workers engaged in the rescue or evacuation and the person directing the rescue.

(3) A rescue worker must not enter a confined space unless there is at least one additional worker located outside to render assistance.

(4) A self-contained breathing apparatus, or air supplied respirator with escape bottle, must be used during rescue operations in an unknown or IDLH atmosphere.

Note: Rescue procedures must apply every possible effort to eliminate, control or reduce the risk to emergency personnel responding to emergency situations including the use of mechanical ventilation.

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9.42 When required

(1) When entering a confined space which contains a high hazard atmosphere, a risk of entrapment or engulfment or with any other recognized serious health or safety hazard, the worker must wear a harness of a type which will keep the worker in a position to permit rescue.

(2) A lifeline must be attached to the harness and be tended at all times by a standby person stationed outside the entrance to the space.

(3) The standby person must be equipped with suitable lifting equipment if necessary to permit rescue.

(4) The use of a lifeline is not required if the risk assessment identifies obstructions or other conditions that make its use impractical or unsafe.

9.43 Standards

Harnesses, lifelines and lifting equipment must meet the requirements of standards acceptable under this Regulation.

9.44 Line entanglement

If one or more workers enter a confined space, provision must be made to prevent the entanglement of lifelines and other equipment.

9.45 Additional workers

If rescue cannot be effected by the standby person(s) using harnesses, lifelines and lifting equipment, then one or more additional workers must be stationed at the entrance to the confined space and these workers must be equipped and capable of entering the space and effecting rescue.

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9.46 Personal protective equipment

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

9.47 Emergency escape respirator

Workers entering a confined space which contains a high hazard atmosphere must carry on their person or have within arm's reach an emergency escape respirator sufficient to permit them to leave the confined space without assistance.

9.48 Compressed gas cylinders

A cylinder of compressed gas is not permitted inside a confined space, except for a cylinder of compressed air supplied to a respirator, medical resuscitation equipment, handheld aerosol spray containers, fire extinguishers, or other equipment permitted by the Board.

[Enacted by B.C. Reg. 253/2001, effective January 28, 2002.]

9.49 Torches and hoses

When practicable, torches and hoses used for welding, brazing or cutting must be removed from a confined space when not in use and when the confined space is vacated.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

Note: It may be impracticable to remove hoses for some short duration breaks of 60 minutes or less, particularly where the confined space is large or where the removal of hoses may create some risk to workers, for example, when hoses are removed from scaffolding. If removal is impracticable, alternate measures must be adopted under sections 9.4 and 9.5. The preferred method in most cases is to disconnect at source with safe venting procedures together with procedures to ensure no inadvertent

reconnection while workers are on the break or, if this is not practicable, closing and putting a tag on connections located outside the confined space. Other applicable requirements in Part 9 must also be followed including those on ventilation, standby persons and retesting prior to re-entry. For further information, see the OHS Guideline on section 9.49 at www.worksafebc.com.

9.50 Electrical equipment

(1) Electrical tools and equipment used in a confined space must be grounded or double-insulated and so marked, and if wet or damp conditions exist inside the space, must be protected by an approved ground fault circuit interrupter as required by Part 19 (Electrical Safety).

(2) Electrical tools and equipment used in a confined space where flammable vapours of explosive gases, or liquids are present must be CSA approved for hazardous locations classified under *CSA Standard C22.1-94, Canadian Electrical Code Part 1*, as Class 1, Division 2, Groups A, B and C.

9.51 Non-sparking tools

Only non-sparking tools may be used in a confined space where flammable or explosive gases, vapours or liquids are present.

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Part 10 De-energization and Lockout

Part 10 Contents

De-energization and Lockout

10.1 Definitions

In this Part

"control system isolating device" means a device that physically prevents activation of a system used for controlling the operation of machinery or equipment;

"energy isolating device" means a device that physically prevents the transmission or release of an energy source to machinery or equipment;

"energy source" means any electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other source of energy of potential harm to workers;

"key securing system" means a system which physically prevents access to keys when locks or positive sealing devices are applied in a group lockout procedure;

"lockout" means the use of a lock or locks to render machinery or equipment inoperable or to isolate an energy source in accordance with a written procedure;

"maintenance" means work performed to keep machinery or equipment in a safe operating condition, including installing, repairing, cleaning, lubricating and the clearing of obstructions to the normal flow of material;

"normal production" means work that is routine, repetitive, and integral to the normal use of machinery or equipment for production;

"personal lock" means a lock provided by the employer for use by a worker to ensure personal lockout protection such that each lock when applied is operable only by a key in the worker's possession, and by a key under the control of the supervisor or manager in charge.

10.2 General requirement

If the unexpected energization or startup of machinery or equipment or the unexpected release of an energy source could cause injury, the energy source must be isolated and effectively controlled.

10.3 When lockout required

(1) If machinery or equipment is shut down for maintenance, no work may be done until

(a) all parts and attachments have been secured against inadvertent movement,

(b) where the work will expose workers to energy sources, the hazard has been effectively controlled, and

(c) the energy isolating devices have been locked out as required by this Part.

(2) If machinery or equipment is in use for normal production work, subsection (1) applies if a work

activity creates a risk of injury to workers from the movement of the machinery or equipment, or exposure to an energy source, and the machinery or equipment is not effectively safeguarded to protect the workers from the risk.

10.4 Lockout procedures

(1) When lockout of energy isolating devices is required, the devices must be secured in the safe position using locks in accordance with procedures that are made available to all workers who are required to work on the machinery or equipment.

(2) The employer must ensure that each worker required to lock out has ready access to sufficient personal locks to implement the required lockout procedure.

(3) Combination locks must not be used for lockout.

(4) Each personal lock must be marked or tagged to identify the person applying it.

(5) Procedures must be implemented for shift or personnel changes, including the orderly transfer of control of locked out energy isolating devices between outgoing and incoming workers.

(6) If the use of a personal lock is not practicable for lockout, another effective means, if approved by the Board, may be used in place of a personal lock to secure an energy isolating device in the safe position.

10.5 Access to energy isolating devices

When an energy isolating device is locked out, the lock must not prevent access to other energy isolating devices supplying machinery or equipment that could cause injury to workers.

10.6 Checking locked out equipment

(1) Effective means of verifying lockout must be provided and used.

(2) Before commencing work, a worker must verify that all energy sources have been effectively locked out.

10.7 Worker responsibilities

Each worker who works on machinery or equipment requiring lockout is responsible for

(a) locking out the energy isolating devices before starting work, except as provided by section 10.9,

(b) removing personal locks on the completion of his or her work, and

(c) maintaining immediate control of the key(s) to personal locks throughout the duration of the work.

10.8 Removal of locks

(1) A personal lock must only be removed by the worker who installed it, or if this is not possible, the matter must be referred to the supervisor or manager in charge, who will be responsible for its removal.

(2) The supervisor or manager in charge must

(a) make every reasonable effort to contact the worker who installed the lock, and

(b) ensure that the machinery or equipment can be operated safely before removing the lock.

(3) A worker must be notified at the start of his or her next shift if the worker's personal lock(s) have been removed since the worker's previous shift.

10.9 Group lockout procedure

(1) If a large number of workers are working on machinery or equipment or a large number of energy isolating devices must be locked out, a group lockout procedure that meets the requirements of subsections (2) to (7) may be used.

(2) In a group lockout procedure 2 qualified workers must be responsible for

(a) independently locking out the energy isolating devices,

(b) securing the keys for the locks used under paragraph (a) with personal locks or other positive sealing devices acceptable to the Board, and

(c) completing, signing and posting a checklist that identifies the machinery or equipment components covered by the lockout.

(3) Before commencing work each worker working on the locked out components must apply a personal lock to the key securing system used in subsection (2)(b).

(4) Workers may lock out a secondary key securing system if 2 qualified workers lock out the primary key securing system and place their keys in the secondary system.

(5) On completion of his or her work, each worker referred to in subsections (3) and (4) must remove his or her personal lock from the key securing system.

(6) When the requirements of subsection (5) have been met and it has been determined that it is safe to end the group lockout, 2 qualified workers must be responsible for removing their personal locks or the positive sealing device(s) from the key securing system or systems containing the keys for the locks used under subsection (2)(a), and once those keys are released, the system is no longer considered to be locked out.

(7) The written group lockout procedure must be conspicuously posted at the place where the system is in use.

10.10 Alternative procedures

(1) If lockout of energy isolating devices as required by section 10.3 is not practicable,

(a) in the case of a power system as defined in Part 19 (Electrical Safety), the requirements of that Part must be followed,

(b) in the case of mobile equipment as defined in Part 16 (Mobile Equipment), the requirements of that

Part must be followed,

(c) in the case of machinery or equipment designed and equipped with effective control system isolating devices, the devices must be locked out as required by sections 10.4 to 10.9, and 10.10(2), and

(d) in an emergency, the energy isolating devices or control system devices must be effectively controlled to prevent inadvertent start up or hazardous energy release.

(2) Control system isolating devices and the procedures for using them must be approved in writing by the Board, and must be used by workers qualified and authorized to carry out the work.

10.11 Locks not required

The application of a lock is not required under section 10.3 or 10.10 if

(a) the energy isolating device is under the exclusive and immediate control of the worker at all times while working on the machinery or equipment, or

(b) a tool, machine or piece of equipment which receives power through a readily disconnected supply, such as an electrical cord or quick release air or hydraulic line, is disconnected from its power supply and its connection point is kept under the immediate control of the worker at all times while work is being done.

10.12 Work on energized equipment

If it is not practicable to shut down machinery or equipment for maintenance, only the parts which are vital to the process may remain energized and the work must be performed by workers who

(a) are qualified to do the work,

(b) have been authorized by the employer to do the work, and

(c) have been provided with and follow written safe work procedures.

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Part 11 Fall Protection

Part 11 Contents

Fall Protection

11.1 Definitions

In this Part

"anchor" means a component or subsystem of a fall protection system used to connect the other parts of a fall protection system to an anchorage, and includes an anchorage connector;

"anchorage" means a secure connection point for a fall protection system;

"fall arrest system" means a system that will stop a worker's fall before the worker hits the surface below;

"fall protection system" means

(a) a fall restraint system,

(b) a fall arrest system, or

(c) work procedures that are acceptable to the Board and minimize the risk of injury to a worker from a fall;

"fall restraint system" means a system to prevent a worker from falling from a work position, or from travelling to an unguarded edge from which the worker could fall;

"full body harness" means a body support device consisting of connected straps designed to distribute the force resulting from a fall over at least the thigh, shoulders and pelvis, with provision for attaching a lanyard, lifeline or other components;

"horizontal lifeline system" means a system composed of a synthetic or wire rope, installed horizontally between 2 anchors, to which a worker attaches a personal fall protection system;

"lanyard" means a flexible line of webbing, or synthetic or wire rope, that is used to secure a safety belt or full body harness to a lifeline or anchor;

"lifeline" means a synthetic or wire rope, rigged from one or more anchors, to which a worker's lanyard or other part of a personal fall protection system is attached;

"personal fall protection system" means a worker’s fall restraint system or fall arrest system composed of

(a) a safety belt or full body harness, and

(b) a lanyard, lifeline and any other connecting equipment individual to the worker

that is used to secure the worker to an anchor, an anchorage or a horizontal lifeline system;

"safety belt" means a body support device consisting of a strap with a means for securing it about the waist and attaching it to other components;

[Amended by B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 404/2012, effective April 1, 2013.]

11.2 Obligation to use fall protection

(1) Unless elsewhere provided for in this Regulation, an employer must ensure that a fall protection system is used when work is being done at a place

(a) from which a fall of 3 m (10 ft) or more may occur, or

(b) where a fall from a height of less than 3 m involves a risk of injury greater than the risk of injury from the impact on a flat surface.

(2) The employer must ensure that guardrails meeting the requirements of Part 4 (General Conditions) or other similar means of fall restraint are used when practicable.

(3) If subsection (2) is not practicable, the employer must ensure that another fall restraint system is used.

(4) If subsection (3) is not practicable, the employer must ensure that one of the following is used:

(a) a fall arrest system;

(b) a rope access system that meets the requirements of Part 34.

(5) If subsection (4) is not practicable, or will result in a hazard greater than if a fall arrest system or a rope access system was not used, the employer must ensure that work procedures are followed that are acceptable to the Board and minimize the risk of injury to a worker from a fall.

(6) Before a worker is allowed into an area where a risk of falling exists, the employer must ensure that the worker is instructed in the fall protection system for the area and the procedures to be followed.

(7) A worker must use the fall protection system provided by the employer.

[Amended by B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 199/2014, effective February 1, 2015.]

11.3 Fall protection plan

(1) The employer must have a written fall protection plan for a workplace if

(a) work is being done at a location where workers are not protected by permanent guardrails, and from

which a fall of 7.5 m (25 ft) or more may occur, or

(b) section 11.2(5) applies.

(c) Repealed. [B.C. Reg. 420/2004, effective January 1, 2005.]

(2) The fall protection plan must be available at the workplace before work with a risk of falling begins.

(3) Repealed. [B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 420/2004, effective January 1, 2005.]

11.4 Selection of harness or belt

(1) A worker must wear a full body harness or other harness acceptable to the Board when using a personal fall protection system for fall arrest.

(2) A worker must wear a safety belt, a full body harness or other harness acceptable to the Board when using a personal fall protection system for fall restraint.

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

11.5 Equipment standards

Equipment used for a fall protection system must

(a) consist of compatible and suitable components,

(b) be sufficient to support the fall restraint or arrest forces, and

(c) meet, and be used in accordance with, an applicable CSA or ANSI standard in effect when the equipment was manufactured, subject to any modification or upgrading considered necessary by the Board.

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

11.6 Anchors

(1) In a temporary fall restraint system, an anchor for a personal fall protection system must have an ultimate load capacity in any direction in which a load may be applied of at least

(a) 3.5 kN (800 lbs), or

(b) four times the weight of the worker to be connected to the system.

(2) Each personal fall protection system that is connected to an anchor must be secured to an independent attachment point.

(3) In a temporary fall arrest system, an anchor for a personal fall protection system must have an ultimate load capacity in any direction required to resist a fall of at least

(a) 22 kN (5 000 lbs), or

(b) two times the maximum arrest force.

(4) A permanent anchor for a personal fall protection system must have an ultimate load capacity in any direction required to resist a fall of at least 22 kN (5 000 lbs).

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 19/2006, effective May 17, 2006.]

[Amended by B.C. Reg. 404/2012, effective April 1, 2013.]

11.7 Temporary horizontal lifelines

A temporary horizontal lifeline system may be used if the system is

(a) manufactured for commercial distribution and installed and used in accordance with the written instructions from the manufacturer or authorized agent, and the instructions are readily available in the workplace,

(b) installed and used in accordance with written instructions certified by a professional engineer, and the instructions are readily available in the workplace, or

(c) designed, installed and used in a manner acceptable to the Board.

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 19/2006, effective May 17, 2006.]

11.8 Certification by engineer

The following types of equipment and systems, and their installation, must be certified by a professional engineer:

(a) permanent anchors,

(b) anchors with multiple attachment points,

(c) permanent horizontal lifeline systems, and

(d) support structures for safety nets.

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

11.9 Inspection and maintenance

Equipment used in a fall protection system must be

(a) inspected by a qualified person before use on each workshift,

(b) kept free from substances and conditions that could contribute to its deterioration, and

(c) maintained in good working order.

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

11.10 Removal from service

(0.1) If, at any time, a permanent anchor does not meet the requirements of section 11.5 (c), the anchor must not be used until it has been inspected and recertified, by a professional engineer, as meeting the requirements of section 11.5 (c).

(1) After a fall protection system has arrested the fall of a worker, it must

(a) be removed from service, and

(b) not be returned to service until it has been inspected and recertified as safe for use by the manufacturer or its authorized agent, or by a professional engineer.

(2) Subject to subsection (3), subsection (1) (b) does not apply to a personal fall protection system designed and intended for reuse by a performer in the entertainment industry for conducting a planned fall sequence.

(3) The following conditions must be met before a personal fall protection system described in subsection (2) will be exempt from subsection (1) (b):

(a) the system must be designed and used in accordance with a standard acceptable to the Board;

(b) each use of the system must be carried out in accordance with the plan for the conduct of the fall;

(c) the peak arrest forces generated in the system during each use must be at or below both the planned limits and the maximum forces allowed for the system;

(d) after each use of the system no part of the system, including the anchorage, may be reused until a qualified person has inspected it and determined it is in serviceable condition and safe for reuse.

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 404/2012, effective April 1, 2013.]

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12.1 Definitions

In this Part

"guard" means a type of safeguard consisting of a physical barrier which prevents a worker from reaching over, under, around or through the barrier to a moving part or point of operation;

"jumbo" means a mobile platform having one or more levels which provides work areas for persons, machines, tools, drills or other materials;

"point of operation" means the danger area in a machine where a part is being formed or work is being done;

"power transmission part" means any moving part of a machine that transfers power from a power source to a point of operation;

"safeguard" means the use of a guard, a safety device, a shield, an awareness barrier, warning signs, or other appropriate means, either singly or in combination, to provide effective protection to workers from hazards;

"safety device" means a type of safeguard consisting of an arrangement of operating controls, an active or passive physical restraint, an interlock, or a presence sensing device which ensures that a worker cannot access or be in a hazardous area while a machine is operating;

"shield" means a type of safeguard consisting of a physical cover or barrier which restricts but does not prevent access to a hazardous moving part or a point of operation.

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General Requirements

12.2 Safeguarding requirement

Unless elsewhere provided for in this Occupational Health and Safety Regulation, the employer must ensure that machinery and equipment is fitted with adequate safeguards which

(a) protect a worker from contact with hazardous power transmission parts,

(b) ensure that a worker cannot access a hazardous point of operation, and

(c) safely contain any material ejected by the work process which could be hazardous to a worker.

12.3 Standards

The application, design, construction and use of safeguards, including an opening in a guard and the reach distance to a hazardous part, must meet the requirements of *CSA Standard Z432-94, Safeguarding of Machinery*.

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

* See also section 4.4 of the OHS Regulation.

12.4 Effectiveness of safeguards

A safeguard must be capable of effectively performing its intended function.

12.5 Fixed guards

A fixed guard must not be modified to be readily removable without the use of tools.

12.6 Lubrication

A guard must be designed, where practicable, to allow lubrication and routine maintenance without removal of the guard.

12.7 Opening and reach distance

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

* See sections 4.4, and 12.3 of the OHS Regulation.

12.8 Lockout

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

* See sections 10.2, and 10.3 of the OHS Regulation.

12.9 Safe operation

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

* See section 4.3 of the OHS Regulation.

12.10 Identifying unsafe equipment

An unsafe tool, machine or piece of equipment must be removed from service and identified in a manner which will ensure it is not inadvertently returned to service until it has been made safe for use.

Note: The procedure for determining whether the tool, machine or piece of equipment is unsafe for use is provided by the requirements on the correction of unsafe conditions and refusal of unsafe work in Part 3 (Rights and Responsibilities).

12.11 Operating controls

(1) Powered equipment other than portable powered tools or mobile equipment must have

(a) starting and stopping controls located within easy reach of the operator,

(b) controls and switches clearly identified to indicate the functions they serve,

(c) controls positioned, designed or shielded as necessary to prevent inadvertent activation,

(d) if two-hand controls are installed, controls designed to require concurrent use of both hands to operate the equipment, and to require both controls to be released before another machine cycle can be initiated, and

(e) control systems meeting the requirements of this Regulation.

(2) Portable powered tools and mobile equipment must have operating controls conforming to an appropriate standard acceptable to the Board.

12.12 Machinery location

A machine must be located or safeguarded so that operation of the machine will not endanger workers using normal passage routes about the workplace or operating an adjacent machine.

12.13 Marking physical hazards

A physical hazard must be marked in a manner that clearly identifies the hazard to the affected workers.

Note: The following standards provide guidance for the effective identification of hazards:

(a) *CSA Standard CAN/CSA-Z321-96, Signs and Symbols for the Workplace*;

(b) *ANSI Standard Z535.1-1991, Safety Color Code;*

(c) *ANSI Standard Z535.2-1991, Environmental and Facility Safety Signs;*

(d) *ISO Standard 3864:1984, Safety Colours and Safety Signs.*

12.14 Identification of piping

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

* See section 5.11 of the OHS Regulation.

(2) A piping system containing substances other than hazardous products must be identified in a manner known to the affected workers.

(3) The identification markings on a piping system must be maintained in a legible condition.

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

[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

12.15 Restraining devices

Effective means of restraint must be used

(a) on a connection of a hose or a pipe if inadvertent disconnection could be dangerous to a worker,

(b) if unplanned movement of an object or component could endanger a worker, or

(c) to secure an object from falling and endangering a worker.

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12.16 Rotating hazards

Rotating parts, such as friction drives, shafts, couplings and collars, set screws and bolts, keys and

keyways, and projecting shaft ends, exposed to contact by workers must be guarded.

Note: If the projection of a shaft is less than half the shaft diameter and is free of snagging hazards, no guard is required.

12.17 Gears and sprockets

(1) Every gear and chain sprocket must be completely enclosed, or if complete enclosure is impracticable, must have band-type guards with flanges extending below the root of the teeth.

(2) If there is a hazard from rotating spokes, the spokes must be guarded on the sides accessible to workers.

12.18 Reciprocating machinery

A crank, connecting rod, tail rod, extension piston rod or other reciprocating or oscillating part exposed to contact by workers must be guarded.

12.19 Drive belts

A power transmission belt, rope or chain must be guarded to protect workers who would be endangered in the event of its failure.

12.20 Reaching up

(1) The in-running nip point of a power transmission belt, rope or chain, and any portion of a flywheel or pulley located within 2.5 m (8 ft) above a floor, walkway or platform must be guarded to prevent contact by workers.

(2) An installation of the type covered by subsection (1) in place before January 1, 1999, which has unguarded parts more than 2.1 m (7 ft) but less than 2.5 m (8 ft) above the floor, walkway or platform may have those portions remain unguarded unless the work process presents an undue risk to workers if those portions remain unguarded, or until such time as the installation is substantially overhauled or renovated.

12.21 Flywheels and pulleys

(1) A pit for a flywheel or pulley must have curbs or toeboards around the upper edge of the pit.

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

* See section 4.3 of the OHS Regulation.

(3) A flywheel or pulley which is defective or has been exposed to excessive heat must be removed from service and must not be returned to service until it has been repaired according to the manufacturer's recommendations, or certified safe for use by a professional engineer.

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

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12.22 Standards

Unless otherwise permitted by this Regulation, a conveyor must meet the requirements of *ANSI Standard ANSI/ASME B20.1-1993, Safety Standards for Conveyors and Related Equipment*.

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

* See also section 4.4 of the OHS Regulation.

12.23 Belt-type conveyors

A belt conveyor must have accessible nip points of spools and pulleys guarded to prevent contact by a worker.

12.24 Screw-type conveyors

(1) The moving parts of a screw-type conveyor must be guarded from contact by a worker.

(2) Each guard on a screw-type conveyor must be secured by fasteners requiring a tool for removal.

(3) The openings in mesh and grid guards must meet the requirements of Appendix A of *CSA Standard Z432-94, Safeguarding of Machinery*.

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

* See also section 4.4 of the OHS Regulation.

12.25 Feed points

If the feed point for a conveyor cannot be guarded because of the work process, any workers required to be in the area must have and use suitable devices and tools which prevent the worker from contacting moving parts of the conveyor system.

Note: Suitable devices include safety belts and lanyards rigged to prevent the worker from contacting moving parts. Suitable tools include materials-handling tools such as shovels or rakes, except shovels or other tools with "D" handles must not be used.

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

* See sections 10.2 and 10.3 of the OHS Regulation.

12.27 Falling materials

A conveyor must have guards or sideboards to prevent material from falling from the conveyor into areas occupied by workers if the falling material presents a hazard of impact injury or burn.

12.28 Emergency stopping devices

(1) A conveyor must have an emergency stopping system unless worker access to the conveyor is prevented by guarding.

(2) The conveyor emergency stopping system must be designed and installed so that the system will activate as a worker falls onto the conveyor, or if a fallen worker on the conveyor moves an arm or leg off to one side of the conveyor.

(3) If a conveyor emergency stopping system uses a pull wire, the system must activate by a pull of the wire in any direction, or by a slack cable condition.

(4) The conveyor emergency stopping system must be designed and installed so that after an emergency stop, manual resetting is required before the conveyor can be restarted.

(5) A conveyor must not be restarted after an emergency stop until inspection has determined it can is be operated safely.

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Power Presses, Brake Presses and Shears

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12.29 Standards

Point of operation safeguarding, and the design, construction and reliability of operating controls of a power press, brake press, ironworker or shear must meet the requirements of the following applicable standard:

(a) *CSA Standard CAN/CSA-Z142-M90, Code for Punch Press and Brake Press Operation: Health, Safety, and Guarding Requirements;*

(b) *ANSI Standard B11.4-1993, American National Standard for Machine Tools — Shears — Safety Requirements for Construction, Care, and Use;*

(c) *ANSI Standard B11.5-1988 (R1994), American National Standard for Machine Tools — Ironworkers*

— *Safety Requirements for Construction, Care, and Use*.

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

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

* See section 4.4 of the OHS Regulation.

12.30 Point of operation safeguarding

(1) The point of operation of a power press, brake press or shear must be safeguarded to prevent injury to the operator or any other worker.

(2) A hand feeding or extraction tool must not be used as a substitute for point of operation safeguarding.

(3) A guillotine or alligator shear must have a guard or other device which protects the operator from flying particles or material emanating from the shears.

(4) The point of operation of a manually powered press, shear or cutter must be effectively guarded.

12.31 Exception for custom work

The safeguarding for the point of operation of a brake press may be removed if custom or different bends are being done with each cycle of the machine, provided that safe work procedures are followed, and safeguarding is replaced upon completion of such custom work.

12.32 Supervisory control

If a power press or brake press is being used in a production mode the keys for all control selector switches must remain under a supervisor's control.

12.33 Flywheel guarding

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

* See section 12.20 of the OHS Regulation.

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Feed-Rolls and Metal-Forming Rolls

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12.34 Feed-rolls

Feed-rolls must have a guard or safety device to prevent the operator from contacting any in-running nip points.

12.35 Guard design

A feed-roll guard must be effective for the material thickness being processed, and the clearance between the guard and the material passing through the feed-rolls must not exceed 6 mm (1/4 in).

12.36 Metal-forming rolls

If the work process on metal-forming rolls precludes the use of guards, an emergency stopping system must be installed across the machine, and also across the rear (offside) of the machine if a worker is exposed to the hazard on that side, and the emergency stopping system must activate automatically when contacted.

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12.37 Splash guards and shields

Cutting or cooling fluids, metal chips, swarf or turnings from machine tool work must be contained.

12.38 Lathe chucks

Dogs that extend beyond the circumference of a lathe chuck must be safeguarded from contact by the operator.

12.39 Restriction on hand polishing

Lathe stock must be polished with tools designed for this purpose, and the use of hand held strips of abrasive cloth is prohibited.

12.40 Stock projection

Safeguards must be provided to prevent a worker from contacting stock projecting from a machine tool.

12.41 Shapers/planers

A shaper or planer bed opening must be covered or safeguarded to eliminate shearing hazards.

12.42 Carriage travel

Safeguards must be installed at the farthest points of travel of the carriage or table of a shaper, planer, surface grinder or similar equipment to protect workers against contact with moving parts.

12.43 Vertical boring mills

The rim of the revolving table of a vertical boring mill must be safeguarded to prevent contact by workers.

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12.44 Standards

An abrasive wheel must be guarded, used and maintained to meet the requirements of *ANSI Standard B7.1-1988, The Use, Care and Protection of Abrasive Wheels*.

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

* See also section 4.4 of the OHS Regulation.

12.45 Protective hood

(1) An abrasive wheel must have a protective hood that will contain fragments of the wheel should it break apart while turning.

(2) Subsection (1) does not apply to

(a) an abrasive wheel used for internal work,

(b) a mounted wheel of any shape or type which is 50 mm (2 in) or less in diameter,

(c) a threaded-hole, cone or plug type of wheel if the nature of the work provides protection, or

(d) a portable grinder when it is being used for grinding root passes in welded pipe, provided it has a protective hood covering at least 120° of the wheel periphery and the operator wears adequate eye and face protection.

12.46 Speed of abrasive wheels

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

* See section 4.3 of the OHS Regulation.

(2) The allowable arbor or shaft speed of abrasive equipment must be clearly marked on the equipment.

(3) A pneumatic grinder must have a governor which limits maximum shaft speed to that specified by the tool manufacturer, and the maximum rated speed must be marked on the equipment.

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

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

* See section 4.3 of the OHS Regulation.

12.47 Grinding prohibitions

The side of an abrasive wheel must not be used for grinding and non-ferrous materials must not be ground unless the wheel is designed for such use.

12.48 Work rests

When the work is hand-held, a grinding machine must have an adjustable work rest with its upper edge at or above the centreline of the abrasive wheel and within 3 mm (1/8 in) of the cutting surface.

12.49 Dust control

Dust from a grinding or buffing operation must be controlled to prevent a hazard to any worker.

12.50 Dressing grinding wheels

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

* See section 4.3 of the OHS Regulation.

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12.51 Standards

A powder actuated fastening system, consisting of the tool, power loads and fasteners must meet the requirements of *ANSI Standard A10.3-1995, American National Standard for Construction and Demolition Operations — Safety Requirements for Powder-Actuated Fastening Systems*.

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

* See also section 4.4 of the OHS Regulation.

12.52 Tool selection

A low velocity powder actuated tool, with a fastener test speed rating of less than 100 m (330 ft) per second, must be used unless no low velocity tool available on the market is capable of doing the fastening task.

12.53 Tool design

(1) Two separate and distinct operations must be required to activate a powder actuated tool and the final firing movement must be separate and subsequent to depressing the tool into the firing position.

(2) The tool must be designed so that positive means of varying the power level is available, or can be made available, so that the operator may select a power level appropriate to perform the desired work.

12.54 Markings

(1) A powder actuated tool must be marked with the manufacturer's name or trademark, model number and serial number.

(2) A guard or accessory for use with a powder actuated tool must be marked with the manufacturer's name or trademark.

12.55 Storage

(1) When not in use, a powder actuated tool must be unloaded and the tool and power loads must be securely stored and be accessible only to qualified and authorized persons.

(2) Power loads of different power levels and types must be kept in different compartments or containers.

12.56 Tool use

(1) Only a qualified person may handle or use a powder actuated tool or power loads.

(2) The operator must have immediately available when using or servicing a powder actuated tool

(a) a copy of the manufacturer's operating instructions for the tool,

(b) a copy of the power load and fastener charts for the tool, and

(c) any accessories or tools needed for use or field servicing of the tool, including personal protective equipment.

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

(4) A powder actuated tool must not be used in an explosive or flammable atmosphere.

(5) A powder actuated tool may only be loaded when it is being prepared for immediate use, and must be

unloaded at once if work is interrupted after loading.

(6) A powder actuated tool must not be pointed at any person.

(7) If a powder actuated tool misfires, the operator must hold the tool firmly against the work surface for at least 5 seconds, then follow the manufacturer's instructions for such occurrences, and until the cartridge has been ejected, keep the tool pointed in a direction which will not cause injury to any person.

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

* See also sections 4.3 and 4.10 of the OHS Regulation.

12.57 Limitations on use

(1) A powder actuated tool fastener must not be driven into very hard or brittle materials, such as cast iron, glazed tile, hardened steel, glass block, natural rock, hollow tile, and most brick.

(2) A powder actuated tool fastener may only be driven into easily penetrated or thin materials or materials of unknown resistance if the receiving material is backed by a material that will prevent the fastener from passing completely through.

(3) A powder actuated tool fastener must not be driven into steel within 13 mm (1/2 in) of an edge, or within 5 cm (2 in) of a weld except for special applications permitted by the tool manufacturer.

(4) Except for special applications recommended by the manufacturer, a powder actuated tool fastener may not be driven into masonry materials

(a) within 7.5 cm (3 in) of an unsupported edge with a low velocity tool, or

(b) within 15 cm (6 in) of an unsupported edge with a medium or high velocity tool.

(5) A powder actuated tool fastener must not be driven

(a) into concrete unless material thickness is at least 3 times the fastener shank penetration,

(b) into any spalled area, or

(c) through existing holes unless a specific guide means, as recommended and supplied by the tool manufacturer, is used to assure positive alignment.

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12.58 Hand feeding

A template, jig, or pushstick must be used if there is a risk of injury to a worker's hands when feeding woodworking machinery.

12.59 Removing guards

(1) If the use of a guard on woodworking machinery is clearly impracticable for a specific operation, the guard may be removed, but an appropriate pushstick, jig, feather board or similar device must be used to prevent the operator encroaching into the cutting area, and upon completion of the operation the guard must be replaced.

(2) A guard may otherwise only be removed if the guard itself creates a hazard, or if its removal is necessary for maintenance.

12.60 Kickback fingers, splitters, spreaders, and riving knives

(1) If a hand-fed circular saw is used for ripping wood, or is used for any other purpose where there is a risk of kickback, the circular saw must have

(a) anti-kickback fingers and a splitter or spreader designed to prevent kickback, or

(b) a riving knife designed to prevent kickback.

(2) Subsection (1) does not apply when the circular saw is used for grooving, dadoing or rabbeting.

[Enacted by B.C. Reg. 312/2012, effective February 1, 2013.]

12.61 Radial arm saw travel limits

The cutting table and the saw travel stop on a radial arm saw must be designed and maintained so that no part of the saw blade can travel past the forward edge of the cutting table.

12.62 Jointers

A hand-fed wood jointer must have a self adjusting guard over the cutting head on the working side and a guard over the portion of the cutting head behind the fence.

12.63 Sanding machines

(1) The revolving drums, pulleys, nip points, and unused runs of a sanding belt of a sanding machine must be effectively guarded.

(2) Guards must be arranged so that only the portion of the belt necessary for the operation is exposed.

12.64 Tenoning machines

A hand-fed tenoning machine must have a device which holds the material being cut.

12.65 Hand-held circular saws

A hand-held circular saw must have a guard which automatically adjusts to the thickness of the material being cut, and which, when the saw is withdrawn from the material, completely covers the cutting area of the blade.

12.66 Cutting heads

(1) A cutting head on a woodworking tool or piece of equipment such as a router, a shaper or a sticker must be properly adjusted and secured.

(2) If two or more knives are used in one head, they must be balanced.

(3) A cutting head protective hood fitted on woodworking equipment must be strong enough to contain fragments which result from failure of cutting head components.

(4) A small hand-held router using a one piece cutting bit is exempt from the requirements of subsection (3).

12.67 Band saws

(1) A band saw blade must be enclosed or guarded, except for the working side of the blade between the guide rolls and the table.

(2) A band saw wheel must be fully encased.

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12.68 Hand-fed chippers

A hand-fed mobile chipper must have a barrier or baffle installed on the feed side of the rotor to prevent the ejection of chipped material.

12.69 Self-feeding chippers

A self-feeding chipper must have a table or apron extending at least 1.5 m (5 ft) back from the rotor with sides sufficiently high to prevent a worker from reaching in and contacting the rotating knife.

12.70 Driven-feed chippers

(1) A driven-feed chipper must have

(a) a feed table that meets both of the following requirements:

(i) the feed table, including the drop-down extension, if any, must extend at least 150 cm (59 in) from the nip point of the feed rollers;

(ii) the total distance from the nip point of the feed rollers to the ground must be at least 210 cm (82 in), as measured along the centre line of the feed table to the lip of the feed table and then vertically from the lip of the feed table to the ground,

(b) side walls on the feed table, including any drop-down extension, and on the guard chute that are of sufficient height to prevent a worker who is standing on the ground from reaching the feed rollers, and

(c) a feed control bar that is

(i) located across the top and close to the feed end of the guard chute, and

(ii) designed so that a worker endangered by the feed rollers is able to stop or reverse the feed rollers both by

(a) pushing the feed control bar to its forward travel limit, and

(b) pulling the feed control bar to its rearward travel limit.

(2) No part of a person's body may be on the feed table or in the guard chute unless

(a) the feed rollers have stopped, and

(b) the motor of the driven-feed chipper is turned off and locked out.

(3) Despite subsection (1), a driven-feed chipper that is in use in British Columbia before February 1, 2012 may continue to be used if

(a) the driven-feed chipper meets the requirements of subsection (1) (a) and (b),

(b) the feed control bar meets the requirements of subsection (1) (c) (i), and

(c) the feed control bar is designed so that a worker endangered by the feed rollers is able to stop or reverse the feed rollers by at least one of the means set out in subsection (1)(c)(ii).

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

12.71 Vertically fed chippers

On a mobile chipper which gravity feeds material through a vertical hopper to the rotor, the sides of the hopper must be of a depth which prevents the operator from reaching in so as to contact the rotor, but which, in no case, is less than 90 cm (3 ft) measured from the top edge of the hopper to the periphery of the rotor.

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Chain Saws

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12.72 Standards

(1) A chain saw must meet the requirements of *CSA Standard Z62.1-95, Chain Saws*.

(2) A chain saw must have a chain brake that activates automatically upon kickback regardless of the position of the power head or operator's hands.

(3) A chain saw manufactured before January 1, 1999, with a guide bar exceeding 66 cm (26 in), measured from the top of the cutters at the bar tip to the point of the "dogs" or "bumper spikes", is exempt from the requirement for a chain brake.

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

12.73 Stopping chain movement

A chain saw chain must be stopped before the saw operator moves from cut to cut, unless the next cut is in the immediate area and the saw operator can safely move to the next cutting position.

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Automotive Lifts and Other Vehicle Supports

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12.74 Standards

(1) An automotive lift must meet the requirements of *ANSI Standard ANSI/ALI ALCTV-1998, American National Standard for Automotive Lifts — Safety Requirements for Construction, Testing and Validation*.

(2) The operation, inspection and maintenance of an automotive lift must meet the requirements of *ANSI Standard ANSI/ALI ALOIM-2000, American National Standard for Automotive Lifts — Safety Requirements for Operation, Inspection and Maintenance*.

(3) Portable automotive lifting devices and vehicle supports must meet the requirements of the applicable section of *ANSI Standard ASME PALD-2003, Safety Standard for Portable Automotive Lifting Devices*.

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

[Amended by B.C. Reg. 17/2006, effective August 15, 2006.]

12.75 Assembly and installation

An automotive lift, portable automotive lifting device or other vehicle support must be assembled and

installed by qualified personnel.

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

[Amended by B.C. Reg. 17/2006, effective August 15, 2006.]

12.76 Operation

Operation, inspection, repair, maintenance and modification of an automotive lift, portable automotive lifting device or other vehicle support must be carried out according to the manufacturer's instructions or the written instructions of a professional engineer.

[Amended by B.C. Reg. 17/2006, effective August 15, 2006.]

12.77 Records

The employer must keep a maintenance, inspection, modification and repair record for each automotive lift.

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

[Amended by B.C. Reg. 17/2006, effective August 15, 2006.]

12.78 Inspection and testing

An automotive lift must be inspected and tested monthly in a manner acceptable to the Board, unless the manufacturer requires more frequent inspection and testing.

[Amended by B.C. Reg. 17/2006, effective August 15, 2006.]

12.79 Rated capacity

(1) The rated capacity must be marked on each automotive lift, portable automotive lifting device or other vehicle support and must not be exceeded.

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

(3) If the rated capacity of a device listed in subsection (1) is dependent on the concurrent use of 2 or more devices, the number of devices required to achieve the rated capacity must be clearly marked on the devices.

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

[Amended by B.C. Reg. 17/2006, effective August 15, 2006.]

12.80 Controls

The control for an automotive lift must require continuous pressure by the operator when raising or lowering the unit, and the control must return to the neutral position when released.

12.80.1 Vehicle restraint

Before a runway type automotive lift is used,

(a) manual wheel chocks must be used as the primary means to restrain the vehicle from movement, and

(b) automatic or fixed stops, or a combination of them, must be provided and used as a secondary means to prevent the vehicle from inadvertently rolling off either end of the runway.

[Enacted by B.C. Reg. 17/2006, effective August 15, 2006.]

12.80.2 Swing-arm restraint

(1) An automotive lift that has swing arms must have swing-arm pivot restraints if

(a) no part of the rigid superstructure is under the raised vehicle, or

(b) the lift has 2 or more superstructures and the clearance between the rigid parts of the superstructures on each side of the vehicle is 1.3 m (51 in.) or more.

(2) Swing-arm pivot restraints required under subsection (1) must be designed and maintained to prevent unintentional removal or disengagement of the swing-arm pivot restraints when a vehicle is being supported by the automotive lift.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

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12.81 Tumblers

A tumbler drum must be guarded or enclosed, and any access door in a guard or enclosure must have interlocks which prevent the access door from being opened while the drum is rotating, and the drum from operating while the access door is open.

12.82 Pneumatic nailing and stapling tools

(1) A hand held pneumatic nailing or stapling tool capable of driving fasteners larger than 1.2 mm (0.05 in or 18 gauge ASWG) must not activate unless the operator performs 2 actions, one of which is to place the tool against a work surface.

(2) The trigger of a pneumatic nailing or stapling tool must not be taped or otherwise secured in the "on" position, or held in the "on" position while moving between operations.

(3) The air supply to a pneumatic nailing or stapling tool must be disconnected before adjusting or servicing the tool.

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

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

* See section 4.3 of the OHS Regulation.

12.83 Industrial robots

An industrial robot or robot system must be installed, safeguarded, maintained, tested and started, used, programmed and workers trained to meet the requirements of

(a) *CSA Standard CAN/CSA-Z434-94, Industrial Robots and Robot Systems — General Safety Requirements*, or

(b) *ANSI Standard ANSI/RIA R15.06-1992, American National Standard Industrial Robots and Robot Systems - Safety Requirements*.

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

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

* See section 4.4 of the OHS Regulation.

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Drilling Rock or Similar Materials

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12.84 General requirement

The employer must ensure that before drilling

(a) the back, face and sides of the work area have been scaled and stabilized,

(b) the working face and surrounding area have been thoroughly washed, and

(c) remnants of holes have been inspected for explosives and distinctively marked.

12.85 Drilling equipment

The employer must ensure that

(a) a rock drill is not used unless equipped with a water jet or other device capable of suppressing rock

dust, and

(b) adequate restraining devices are installed on hose connections under pressure, if inadvertent disconnection could endanger workers.

12.86 Control location

Operating controls must not be installed on the feed slide of a top-hammer percussion drill.

12.87 Boom hazard

A worker must not proceed beyond the front of the drill controls of a drill jumbo if the drills are in operation, unless the drilling equipment is specifically designed and certified for that purpose.

12.88 Drill jumbos

(1) A drill jumbo that contains decks must be

(a) fitted with guardrails and toeboards, meeting the requirements of Part 4 (General Conditions), around the upper decks,

(b) equipped with a rack or receptacle for securely storing drill rods and other equipment,

(c) provided with safe access to each working level,

(d) provided with a visual warning system to warn workers located below the upper decks, before a worker above collars a hole or removes the boom stabilizer from the face after finishing a hole, and

(e) securely fixed in position at the face to prevent inadvertent movement during drilling operations.

(2) Explosives must not be brought onto or under a drill jumbo during a drilling operation, nor may holes be loaded until drilling is complete.

12.89 Drilling procedures

A driller must ensure that

(a) the cut is not drilled in the same location as the previous round,

(b) holes are not drilled within 15 cm (6 in) of any part of a bootleg, and

(c) there is no drilling at a face when a hole is loaded or being loaded with explosives except in conformity with the requirements on drilling to refire a misfire, as specified in Part 21 (Blasting Operations).

12.90 Rod handling

(1) A drill operator working without a helper must not manually add or remove drill steel or a drill bit, or service drilling equipment, while the drill is rotating under power.

(2) A worker assisting the drill operator with drill bit or drill steel handling must remain clear of rotating parts of the drill system.

(3) Except as provided in subsection (4), a boom-mounted percussion drill being used with multiple lengths of coupled drill steel must have a rod changer or other effective device installed and used to add or remove drill steel.

(4) If it is not practicable to fit a rod changer to a boom-mounted percussion drill, adequate written safe work procedures for adding and removing drill steel must be available, and the drill must be operated in accordance with those procedures.

12.91 Self-propelled drills

(1) The operator or other workers may only ride on a self-propelled drill if in a safe position inside a roll over protective structure (ROPS).

(2) If there is no ROPS, the drill must have controls for machine travel located to allow the operator to move the machine from a position off the machine and clear of any hazard should the drill roll or slide downhill.

12.92 Cleaning drilled holes

If a drilled hole is being cleaned using an air or water pressure blowpipe, the operator must ensure that everyone is clear of the area made hazardous by blowback.

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Breaking and Melting Metal

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12.93 Breaking metal

An effective guard or barrier must be installed to protect workers from flying metal fragments if a drop weight or other impact device is used to break castings or other metal.

12.94 Inspection of linings

A furnace, crucible, ladle, mould or other equipment for handling or containing molten metal must be inspected at regular intervals to determine the condition of the lining, and if any abnormal deterioration is observed the equipment must be removed from service without delay.

12.95 Preventing eruptions

All practicable means must be used to prevent eruptions caused by moisture in furnaces, ladles, crucibles,

molds and other equipment containing molten metal.

12.96 Inspection of materials

(1) Material to be put in a melting furnace must be carefully inspected to ensure that a cylinder, tank or similar closed vessel of any description is not placed in the furnace.

(2) Before being exposed to the intense heat of a furnace, a closed vessel must be cut open to eliminate the explosion hazard, but must not be cut open using a method involving the application of heat or flame.

(3) If a worker must be situated near an open furnace during charging operations, the material to be melted must be carefully examined and, if necessary, must be sufficiently preheated to ensure that moisture and foreign substances are eliminated.

(4) Preheating must be done under controlled circumstances to ensure that no worker is endangered by the process.

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Abrasive Blasting and High Pressure Washing

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12.97 Definitions

In sections 12.97 to 12.111

"cabinet" means an enclosure designed to permit abrasive blasting, high pressure washing or a similar operation to be conducted safely inside the enclosure by a worker who is outside the enclosure;

"enclosure" means a temporary or permanent enclosure of a work area provided with exhaust ventilation and makeup air to reduce exposure of workers inside the enclosure and prevent the uncontrolled release of air contaminants from the enclosure;

"high pressure washing" or "jetting" means the use of water or other liquid delivered from a pump at a pressure exceeding 34 MPa (5,000 psi), with or without the addition of solid particles, to remove unwanted matter from a surface or to penetrate into the surface of a material for the purpose of cutting that material.

12.98 Risk assessment

The employer must ensure that a risk assessment is done before any abrasive blasting activity, high pressure washing process, or related cleanup is started which may cause release of a harmful level of an air contaminant from a surface or coating containing a toxic heavy metal or asbestos.

12.99 Work procedures outside a cabinet

If abrasive blasting, high pressure washing or a similar operation is conducted by a worker outside a cabinet, written safe work procedures addressing the hazards and necessary controls must be prepared and implemented by the employer.

12.100 Substitution

Abrasive blasting materials containing crystalline silica must be replaced with less toxic materials, when practicable.

12.101 Reuse prohibition

(1) An abrasive material must not be reused if it

(a) contains crystalline silica, or

(b) becomes contaminated with any harmful impurities including metals such as lead, chromium, nickel or mercury.

(2) The requirements of subsection (1) do not apply to a fully enclosed, vented cabinet designed to recirculate the abrasive material.

12.102 Cleanup

(1) Used abrasive blasting materials which contain a substance designated under section 5.57 must be removed from the work area by using effective procedures designed to minimize the generation of airborne dust, and suitable personal protective equipment.

(2) Removal under subsection (1) must take place by the end of each shift unless

(a) a risk assessment establishes that the risks from removal will exceed the risks from leaving the materials in place,

(b) no workers will be exposed to the materials before removal occurs, or

(c) the materials cannot be separated from the environment in which the abrasive blasting takes place.

(3) If removal is delayed pursuant to subsection (2), the employer must assess the risks arising from delaying the removal and develop safe work procedures.

(4) The work procedures developed under subsection (3) must be in writing.

[Enacted by B.C. Reg. 253/2001, effective January 28, 2002.]

Note: Section 4.41 of this Regulation requires that waste abrasive blasting materials not be allowed to accumulate so as to become hazardous to workers. Part 8 (Personal Protective Clothing and Equipment) of this Regulation provides requirements for respiratory and other forms of personal protective equipment to be used in the workplace.

12.103 Engineering controls

Engineering controls such as an enclosure or local exhaust ventilation with dust collection must be used to maintain airborne contaminant levels below exposure limits, where practicable.

12.104 Exhaust ventilation

(1) When abrasive blasting or a similar operation is conducted within a structure, the process must be isolated in a separate, properly ventilated enclosure or cabinet to minimize worker exposure to air contaminants generated by the process.

(2) When abrasive blasting or a similar operation is conducted inside an enclosure or cabinet, the enclosure or cabinet must have exhaust ventilation that

(a) maintains air pressure below the air pressure outside the enclosure or cabinet, so as to prevent the escape of air contaminants from the enclosure or cabinet to other work areas, and

(b) minimizes worker exposure inside the enclosure.

12.105 Restricted work zones

(1) When abrasive blasting or a similar operation is conducted outside a structure, the process must be restricted to a work zone which is identified by signs or similar means as being a contaminated area.

(2) Only properly protected workers who are necessary to perform the work are permitted inside an enclosure or a restricted work zone where abrasive blasting or a similar operation is conducted.

12.106 Operating controls

(1) The operating controls for a sandblasting machine or jetting gun must be

(a) located near the nozzle in a position where the operator's hands will be when using the device,

(b) the continuous pressure type that immediately stops the flow of material when released, and

(c) protected from inadvertent activation.

(2) Subsection (1)(a) does not apply to sandblasting machines or jetting guns used in operations where hand operated controls are clearly impracticable, in which case the operator must use a foot operated control or equivalent safety device, both of a design acceptable to the Board.

[Enacted by B.C. Reg. 253/2001, effective January 28, 2002.]

Note: An example of a work process in which the hand operation of a sandblasting machine or jetting gun is impracticable is the cleaning of small diameter pipes when the lance must be inserted completely inside the piping for effective cleaning.

12.107 Pressure restriction

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

12.108 Jetting gun

A jetting gun must not be modified except as authorized by the manufacturer.

12.109 Holding work

A worker must not hand hold an object while it is being cleaned or cut by a jetting gun.

12.110 Hose restraint

High pressure hoses, pipes, and fittings must be supported to prevent excessive sway and movement.

12.111 Personal protective equipment

(1) A nozzle or jetting gun operator must wear personal protective clothing and equipment on the body, hands, arms, legs and feet, including the metatarsal area, made of canvas, leather or other material which will protect the worker's skin from injury in the event of contact with the flow from the nozzle.

(2) Unless the process is isolated from the operator in a separate cabinet, a suitable respirator must be provided and worn whenever abrasive blasting or a similar operation is conducted.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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Welding, Cutting and Allied Processes

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12.112 Standards

Welding, cutting and similar processes must be carried out according to the requirements of *CSA Standard W117.2-94, Safety in Welding, Cutting, and Allied Processes*.

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

12.113 Standards for completed work

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

12.114 Ventilation

Effective local exhaust ventilation must be used at any fixed work station to minimize worker exposure to harmful air contaminants produced by welding, burning or soldering.

12.115 Coatings on metals

A coating on metal which could emit harmful contaminants (such as lead, chromium, organic materials, or toxic combustion products) must be removed from the base metal, whenever practicable, before welding or cutting begins.

Note: If materials are to be welded and painted, coordination is necessary. See section 12.129(3) which restricts the application of coatings before welding operations.

12.116 Flammable and explosive substances

(1) A container which may have held a combustible substance must be thoroughly cleaned before any welding or burning operation is carried out on the container.

(2) Burning, welding or other hot work must not be done on any vessel, tank, pipe or structure, or in any place where the presence of a flammable or explosive substance is likely until

(a) tests have been made by a qualified person to ensure the work may be safely performed, and

(b) suitable safe work procedures have been adopted, including additional tests made at intervals that will ensure the continuing safety of the workers.

12.117 Silver solder

Silver solder containing cadmium must not be used without prior written approval from the Board.

12.118 Correct equipment

Welding equipment, including regulators, automatic reducing valves and hoses, must be used only for the gas for which it is designed.

12.119 Equipment inspection

Before using gas welding or burning equipment, the operator must ensure that the equipment is free from defects, leaks, oil and grease.

12.120 Flashback prevention

Suitable safety devices to prevent reverse gas flow and to arrest a flashback must be installed on each hose in an oxyfuel system, between the torch and the regulator.

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

12.121 Receptacles for stubs

Receptacles for electrode stubs must be provided and used.

12.122 Radiation protection

(1) Arc welding must not be carried out unless workers who may be exposed to radiation from the arc

flash are protected by adequate screens, curtains or partitions or wear suitable eye protection.

(2) A screen, curtain or partition near an arc welding operation must be made of or be treated with a flame resistant material or coating, and must have a nonreflective surface finish.

Note: 12 m (40 ft) is the recommended minimum distance from which an electric welding arc should be seen by the unprotected eye.

12.123 Protective clothing and equipment

A worker involved in welding or burning operations must wear

(a) flame resistant work clothing,

(b) gauntlet gloves of leather or other suitable material and arm protection,

(c) an apron of leather or other suitable material for heavy work,

(d) eye and face protection against harmful radiation, particles of molten metal, and while chipping and grinding welds, and

(e) substantial safety footwear made of leather or other suitable material.

Note: Unless specifically manufactured as flame resistant, work clothing made of polyester, acetate, nylon, acrylic or polypropylene fibres, or mixtures of these with wool or cotton do not comply with paragraph (a). Such materials are not flame resistant and will melt while burning, causing deep and extensive burns to the skin. Work clothing made of laminated fabric containing polyurethane sponge should not be worn as it may readily ignite and burn.

Heavier wool or cotton fabrics are preferable to lighter fabrics because they are more difficult to ignite. The fabric should have a smooth tightly woven finish and be maintained in good condition. Follow the manufacturer's directions for all flame resistant protective apparel to ensure that the flame resistant properties are maintained.

12.124 Respiratory protection

A respirator must be provided and worn if an effective means of natural, mechanical or local exhaust ventilation is not practicable

(a) during short duration welding, burning or similar operations, and

(b) during emergency work.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

12.125 Marking hot work

Recently welded or flame cut work must be marked "HOT" or effectively guarded to prevent contact by a worker, if a worker not directly involved in the hot work is likely to enter the work area.

12.126 Fire extinguishers

(1) At least one fire extinguisher of a suitable type and capacity must be immediately available at a work location where welding or cutting is done.

(2) Fire extinguisher locations must be marked and made known to workers.

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Painting, Coating and Work with Plastics and Resins

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12.127 Application

Sections 12.128 to 12.141 apply to a workplace in which there is spraying or use of a paint or similar coating, a fibre reinforced resin, a thermoplastic material, an expandable resin foam, or other similar materials.

12.128 Substitution

(1) An employer must ensure that a less hazardous substance or work process is substituted for a higher hazard substance or process, whenever practicable.

(2) The employer must ensure that a substitute for a paint containing toxic heavy metal components is used if an alternative product exists.

12.129 Restrictions

(1) A toxic or flammable chemical or chlorofluorocarbon must not be used as a propellant in spraying operations.

(2) Spraying a flammable or other hazardous product is prohibited within a general work area, unless effective controls have been installed to control the fire, explosion and toxicity hazards.

(3) When practicable, a coating must not be applied to a material about to be welded.

12.130 Warning signs

A work area or enclosure where hazardous materials are handled or used must be posted with suitable signs or placards warning workers of the hazards within the identified restricted access area and stating the precautions for entry into the area.

12.131 Enclosure

When practicable, a ventilated spray booth or other enclosure designed to control worker exposure must

be used during

(a) any operation or process which involves spraying a paint or resin,

(b) lay-up or moulding of reinforced plastic, or

(c) any application of a paint, coating or insulation containing a sensitizer such as an isocyanate compound, or similar operations using very toxic materials.

12.132 Air flow

(1) The air velocity through a horizontal flow spray booth, a vertical flow, down-draft booth or other enclosure required by section 12.131 must be at least

(a) 50 cm/s (100 fpm) if the cross-sectional area is 14 m^2 (150 ft^2) or less, and

(b) 25 cm/s (50 fpm) if the cross-sectional area is greater than 14 m^2 (150 ft^2).

(2) In outdoor applications of materials listed in section 12.131, an air velocity across the work area of at least 0.25 m/s (50 fpm) must be assured, by mechanical means if necessary, to carry vapours and aerosols away from the breathing zone of a worker.

12.133 Control of ignition sources

A ventilation system used to control airborne contaminants must have electrical and mechanical systems designed to control all potential ignition sources.

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

12.134 Arrester filters

(1) A ventilation system subject to heavy concentrations of overspray from the operation must have an arrester filter.

(2) An arrester filter must be maintained in good operating condition and replaced when the pressure drop across the filter exceeds the design criteria.

12.135 Respiratory protection

Each worker who is or may be exposed to an airborne contaminant generated by a spray operation involving a sensitizing agent referred to in section 5.57(1) must be provided with and wear a supplied-air respirator.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

12.136 Disposal of isocyanate containers

Empty, non-returnable containers which contained isocyanates must be decontaminated by filling them with water and allowing them to stand for a minimum of 48 hours, without being sealed, stoppered or closed, after which they must be pierced to prevent re-use.

12.137 Authorized persons

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

* See section 4.10 of the OHS Regulation.

12.138 Airless spray equipment

An airless spray gun must have

(a) a means to electrically bond the gun to the paint reservoir and pump,

(b) a guard that will protect against trigger activation if the gun is dropped, and

(c) the trigger function configured to require two distinct operations by the user to activate the release of paint or fluid through the nozzle, or a safety device which prevents the nozzle tip from coming into contact with a worker.

12.139 Design for high pressure

An airless spray gun, hose, fitting and pressure vessel must be designed and constructed to withstand the pressure involved.

12.140 Heating plastics

Emissions from operations involved in heating plastics to temperatures which may release thermal decomposition products must be removed from the workplace by local exhaust ventilation when there is a risk of harm to a worker from exposure to these emissions.

12.141 Resin foams

(1) A foam installation process performed indoors must be controlled or contained so that unprotected workers are not exposed to emissions by using an enclosure, portable local exhaust ventilation, or scheduling arrangements.

(2) A foam installation process performed outdoors and relying on natural ventilation must be done in an area restricted to authorized personnel wearing adequate personal protective equipment.

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Laundry and Dry Cleaning Activities

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12.142 Definitions

In sections 12.143 to 12.166

"dry-to-dry machine" means a system in which the washing and drying is done in a single machine that is vented to a vapour recovery system or to the atmosphere during the drying and deodorizing phases of the machine cycle;

"fully enclosed refrigerated system" means a system in which the washing and drying is done in a single machine that is not vented to either a vapour recovery system or to the atmosphere during the drying and deodorizing phases of the machine cycle;

"spot cleaning" means applying spotting solvents or solutions by hand to remove spots or stains;

"transfer system" means a system in which the washing and drying is done in separate machines.

Dry Cleaning

12.143 Open cleaning prohibited

Dry cleaning in an open vessel by immersion, agitation, or spraying is prohibited except as required for spot cleaning.

12.144 Systems and equipment

(1) Dry cleaning systems and equipment must be designed, installed, operated and maintained to prevent the escape of solvent.

(2) Dry cleaning solvents may only be used in transfer, dry-to-dry, or fully enclosed refrigerated systems designed and installed for this purpose.

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

12.145 Equipment labels

A dry cleaning machine must have a label specifying the chemical name of the solvent it has been designed to use.

12.146 Solvent handling

Dry cleaning solvents and additives must be stored and handled in a manner that minimizes evaporation and spillage.

12.147 Bulk storage

A dry cleaning solvent bulk storage tank located inside a building must be effectively vented to the outdoors.

12.148 Machine ventilation

(1) A transfer, dry-to-dry, or fully enclosed refrigerated system must have an effective exhaust ventilation system which operates whenever the loading door is open to create an airflow into the door opening of at least 50 cm/sec (100 fpm) averaged across the face of the opening, and which maintains the concentration of solvent vapour in the workplace below the applicable exposure limits.

(2) A fully enclosed refrigerated system is exempt from the requirements of subsection (1) if workers are not exposed to levels of solvent vapours above 50% of the applicable exposure limits.

12.149 General ventilation

A dry cleaning area must have adequate general ventilation to maintain the concentration of evaporated solvents below the applicable exposure limits.

12.150 Inspection and repair

Dry cleaning equipment must be regularly inspected for liquid and vapour leaks, and any leaks must be repaired promptly.

12.151 Open flame heaters

An open flame heating apparatus must not be located in the same work area as a dry cleaning machine and must have corrosion-resistant flue and draft hoods to conduct products of combustion to the outdoors.

12.152 Combustion air supply

A flame heating apparatus must not obtain combustion air from areas subject to contamination with dry cleaning solvent vapours.

12.153 Vents

A vent pipe and duct which carries solvent vapour from a dry cleaning process, solvent recovery equipment or dry cleaning work area must

(a) have vapour-proof joints,

(b) discharge to the outside atmosphere at least 1.8 m (6 ft) above the roof peak and at least 3 m (10 ft) from any door, window or other building opening, and

(c) not discharge into any flue used for combustion products, nor into any building ventilation duct.

12.154 Servicing and maintenance

(1) A worker who may be exposed to dry cleaning solvent liquid or vapour during equipment servicing such as changing solvent filters, must wear appropriate personal protective equipment to prevent inhalation and skin contact.

(2) A filter or filter material that has been used in a dry cleaning system must be placed in a metal container with a tight fitting lid and stored in a well ventilated area.

12.155 Emergency ventilation

(1) Supplemental floor level emergency ventilation equipment must be available within 4.6 m (15 ft) of the dry cleaning equipment for use in the event of a spill, leak or accidental release of solvent liquid or solvent vapour.

(2) Supplemental ventilating equipment must be capable of changing the air in the dry cleaning area every 5 minutes (12 room-air changes per hour).

(3) The control switch for supplemental ventilation equipment must be readily accessible in an emergency, and must be clearly identified by signs or similar means.

12.156 Spotting chemicals

(1) A work surface where spot cleaning is done must be designed to contain spills and minimize exposure.

(2) Spotting chemicals must be kept in containers which will prevent skin contact, and appropriate skin protection must be used when spot cleaning is done.

12.157 Supplier responsibility

When articles are sent for processing to a laundry or dry cleaning facility, the employer sending the articles must advise the operator of the facility, in writing, of

(a) the identity of any materials contained with the articles which could pose a hazard to workers handling the articles,

(b) the nature of any hazard that may arise from the materials, and

(c) general precautionary measures to be followed when handling the materials.

12.158 Operator responsibility

If articles to be processed may contain materials such as hazardous biological or chemical contaminants, sharp objects, or other materials which would pose a hazard to workers handling the articles, the operator of a laundry or dry cleaning establishment must

(a) determine the nature of any hazard to workers,

(b) develop effective written safe work procedures to minimize the risk of injury and disease, and

(c) ensure that workers are adequately instructed and directed to follow the safe work procedures.

Laundry Equipment

12.159 Flatwork ironers

Feed-rolls for a flatwork ironer must have a front mounted trip bar designed to stop the machine on contact, or a fixed guard that will prevent the operator's hands from entering the rolls.

12.160 Roller-type ironers

(1) A roller-type ironer must have a front mounted fixed guard, designed to prevent the operator's hands from entering the rolls.

(2) The hot roll must be guarded to prevent contact by workers.

12.161 Press-type ironers

(1) A press-type ironer must have an automatic device to prevent the application of injurious pressure when the operator's fingers are between the bed and the pressure-head, or have a device which requires both of the operator's hands to be removed from the danger zone when the machine is tripped.

(2) Hand controls must be well recessed or effectively shrouded to prevent inadvertent activation, require concurrent use of both the operator's hands, and require both controls to be released before another machine cycle can be initiated.

(3) Pads and covers must not be of a type that will allow the garment or fabric to slip off the buck easily, with or without vacuuming.

12.162 Interlocks

Drum-type washing machines and dryers must have devices which prevent the drum from operating while the door is open.

12.163 Centrifugal extractors

A centrifugal extractor must have devices to prevent power being applied before the cover is closed and to prevent the cover being opened while the basket is in motion.

12.164 Laundry chutes

A laundry chute must discharge into an unoccupied area, or have baffles or other equally effective means to prevent laundry coming out of the chute from striking workers.

12.165 Laundry carts

A laundry cart must be maintained in good mechanical condition and free of sharp corners, edges, or splintered wood.

12.166 Spillage

Curbs or other effective means must be provided to contain any liquid spilled from a washing machine, dry cleaning machine or associated equipment.

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Rail Car Movement

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12.167 Application

Sections 12.168 to 12.172 apply to movement of rail cars except those on a federally or otherwise provincially regulated railway.

12.168 General requirements

(1) Written safe work procedures must be developed and made available to all workers involved in moving, loading or unloading railway cars.

(2) Equipment used to move railway cars must be adequately designed and have the capacity to control railway car speed and direction at all times.

(3) Proper, designated attachment points on railway cars must be used to move railway cars.

(4) Railway cars being loaded on a siding must be protected against unexpected movement by other rail traffic on the siding by the "Blue Flag Rule" as specified in the *Canadian Rail Operating Rules*.

(5) Before a railway car is coupled or moved the load must be properly secured and all vehicles and equipment used to load or unload the car must be in the clear.

(6) Derails must be installed and used

(a) where it is possible for railway cars to move freely and to foul other tracks or create other hazards, and

(b) where required by the *Transportation of Dangerous Goods Act, 1992* (Canada).

12.169 Clearance

The employer must identify clearances that are less than the standard clearance with restricted clearance signs as specified in the *Canadian Rail Operating Rules*.

12.170 Riding restriction

If less than standard clearance exists, as specified in the *Canadian Rail Operating Rules,* workers must not ride on the top or sides of railway equipment.

12.171 Brakes

(1) Railway cars on a siding must have an adequate number of hand brakes set to prevent inadvertent movement.

(2) Railway car air brake systems must not be used on a private siding unless authorized by the Engineering and Inspection Branch of the Ministry of Municipal Affairs and Housing[1].

[1] now the BC Safety Authority

12.172 Tracks

(1) All dead end tracks located in areas where workers are required to be must have a means to prevent rail-mounted equipment from travelling off the end of the tracks.

(2) All tracks on private sidings must be maintained to standards which permit the safe transit of all rail-mounted equipment using the tracks.

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Pressure Vessels

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12.173 Pressure relief device - when required

(1) In this section *"pressure vessel"* has the same meaning as in the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation, B.C. Reg. 104/2004.

(2) A pressure vessel must have a pressure relief device that is set to discharge at 103 kPa (15 psi) or less, if the pressure vessel

(a) is connected to a production facility, compressor station or other pressure source, and

(b) is not directly open to the atmosphere.

(3) Subsection (2) does not apply to a pressure vessel if

(a) the pressure vessel is subject to the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation, B.C. Reg. 104/2004, or

(b) the manufacturer of the pressure vessel or a professional engineer indicates in writing that

(i) the pressure vessel will not operate in accordance with its engineered design if the vessel has a pressure relief device that is set to discharge at 103 kPa (15 psi), and

(ii) the pressure vessel can be operated safely without a pressure relief device or with a pressure relief

device that is set to discharge at greater than 103 kPa (15 psi).

(4) A pressurized system, including any lines running from the output side of a pressure relief device that may be subject to accidental restriction, must be protected by a pressure relief device.

[Enacted by B.C. Reg. 312/2012, effective February 1, 2013.]

12.174 Pressure relief device - installation

(1) In this section *"pressure relief device"* means a pressure relief device referred to in section 12.173.

(2) A pressure relief device must

(a) have a flow capacity that is not less than the flow capacity of the pressure source, and

(b) be set to discharge at not more than the pressure rating of the component in the pressurized system with the lowest pressure rating.

(3) Any fluid or material discharged through a pressure relief device must be piped to a place where it will not endanger workers.

(4) The diameter of piping connected to the pressure side and the discharge side of a pressure relief device must not be smaller than the diameter of the openings to the device.

(5) The piping on the discharge side of a pressure relief device must be

(a) secured to prevent movement, and

(b) sloped to drain fluids away from the pressure relief device if freezing could restrict the fluid flow.

(6) A valve must not be installed in the discharge opening of a pressure relief device, or the device's discharge pipe, unless required by engineering design.

(7) A pressure relief device that requires block valves by engineering design must have the block valves locked in the appropriate position.

(8) A guard must be installed around the shear pin and spindle of a pressure relief device.

[Enacted by B.C. Reg. 312/2012, effective February 1, 2013.]

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Roll-on/Roll-off Containers

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NEW

12.175 Definitions

In sections 12.176 to 12.183:

"container safety standard" means *ANSI Standard ANSI Z245.30-2008, American National Standard for Equipment Technology and Operations for Wastes and Recyclable Materials — Waste Containers — Safety Requirements*;

"roll-on/roll-off container" means a container that

(a) is typically used to receive, store and transport refuse, and

(b) is designed to be used with a vehicle equipped with hydraulic or mechanical tilt-frame and hoist-type equipment, commonly referred to as roll-offs or hook-lifts.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

12.176 Container safety standard NEW

(1) A supplier of a roll-on/roll-off container manufactured on or after February 1, 2015, must ensure that the container is designed and manufactured in accordance with the requirements of the container safety standard.

(2) Employers must ensure that workers handle roll-on/roll-off containers in accordance with the requirements of the container safety standard.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

12.177 Protection against specified hazards NEW

An owner of a roll-on/roll-off container, and an employer, must ensure that persons are not exposed to the following hazards in respect of a roll-on/roll-off container:

(a) the rupture or disintegration, resulting from poor maintenance, of the lifting eye, cables, anchors, latches, doors, guards, hinges or ladder rungs;

(b) being hit or struck by the unintended or premature discharge of any thing or substance collected, used, stored or transported in the container.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

12.178 Visual Inspection before loading container onto vehicle NEW

(1) Before loading a roll-on/roll-off container onto a vehicle, the driver of the vehicle must

(a) visually inspect the container for defects that may be a hazard, and

(b) ensure that the container doors will not open when the container is moved between the ground and the vehicle.

(2) If the driver identifies a defect in a roll-on/roll-off container that may be a hazard, the driver must immediately inform the following, as applicable, of the defect:

(a) his or her employer;

(b) if the driver has no employer, the owner of the container.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

12.179 Withdrawal from service NEW

(1) In this section, "*notified person*" means the person notified under section 12.178(2) that a roll-on/roll-off container has a defect that may be a hazard.

(2) On receiving notification under section 12.178(2), a notified person must

(a) withdraw the container from service immediately, or

(b) if it is not practical to withdraw the container from service immediately,

(i) arrange for the safe removal of the container to a place where it can be unloaded, if necessary, and

(ii) have the container repaired.

(3) A roll-on/roll-off container that has been withdrawn from service or repaired under this section may not be returned to service until inspected under section 12.180.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

12.180 Inspection following repair NEW

(1) An owner of a roll-on/roll-off container, and an employer, must ensure that a roll-on/roll-off container is inspected by a qualified person after any of the following occur:

(a) significant structural modification or refurbishment;

(b) significant repair of a structural component;

(c) repairs made under section 12.179.

(2) The qualified person must determine whether, following the modification, refurbishment or repairs referred to in subsection (1), the container meets the requirements of the container safety standard.

(3) An inspection under this section must occur on or before the earlier of the following:

(a) 30 days after the making of the modification, refurbishment or repairs referred to in subsection (1);

(b) the return of the container to the place where it is ordinarily stored or located.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

12.181 Periodic inspection NEW

(1) An owner of a roll-on/roll-off container, and an employer, must ensure that a qualified person

inspects, in accordance with this section, each roll-on/roll-off container to determine if the container meets the requirements of the container safety standard.

(2) The first inspection of a container manufactured before February 1, 2015, or for which the date of manufacture is unknown, must occur as follows:

(a) if section 12.180 applies, as required by that section;

(b) if the container has not previously been inspected under section 12.180, before August 1, 2017;

(c) if the owner or employer, as applicable, acquires the container on or after June 2, 2017, but has no record of it being inspected in accordance with paragraph (a) or (b) of this subsection, within 60 days of acquiring it.

(3) The first inspection of a container manufactured on or after February 1, 2015, must occur as follows:

(a) if section 12.180 applies, as required by that section;

(b) if a container has not previously been inspected under section 12.180, before February 1, 2020;

(c) if the owner or employer, as applicable, acquires the container on or after December 3, 2019, but has no record of it being inspected in accordance with paragraph (a) or (b) of this subsection, within 60 days of acquiring it.

(4) Subsequent inspections of the container must occur within

(a) 30 months of the most recent inspection, whether made under this section or section 12.180, or

(b) a shorter period set by a qualified person, having regard to the condition of the container.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

12.182 Records of inspection

An owner of a roll-on/roll-off container, and an employer, must keep a record for each roll-on/roll-off container that includes all of the following:

(a) the date of each inspection made under sections 12.180 and 12.181;

(b) details of any tests conducted, including testing methods and results;

(c) details of any repairs made;

(d) the date before which the next inspection must occur under section 12.181.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

12.183 Withdrawal from service following inspection

If a qualified person determines, following an inspection under section 12.180 or 12.181, that a roll-on/roll-off container does not meet the container safety standard, the owner of the container, or the

employer, must withdraw the container from service

(a) until it is repaired to meet the container safety standard, or

(b) permanently.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

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Part 13 Ladders, Scaffolds and Temporary Work Platforms

Part 13 Contents

Division 1 - General

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13.1 Definitions

In this Part:

"boom-supported" means supported by an elevating device that telescopes, articulates, rotates or extends relative to the machine base or vehicle, so that the platform can be positioned completely beyond the base;

"boatswain's chair" also known as a bosun's chair, means a seat attached to a suspended rope designed to accommodate one person in a sitting position;

"elevating work platform" means a movable work platform that self-elevates to overhead work locations;

"movable work platform" means a work platform that can be re-positioned during the course of the work;

"permanent powered platform" means a movable work platform that

(a) is raised or lowered by other than manual means, and

(b) is permanently installed on or attached to a building or structure;

"portable powered platform" means a movable work platform that

(a) is raised or lowered by other than manual means, and

(b) is not permanently installed on or attached to a building or structure;

"scaffold" means any temporary elevated work platform and its supporting structure used for supporting workers, materials or equipment;

"self-propelled" means the capability of an elevating work platform to travel under power with the primary controls on the work platform;

"swing stage" means a work platform that is raised and lowered by manual or powered hoisting equipment, supported by 2 or more suspension lines;

"work platform" means an elevated or suspended temporary work surface used for supporting workers and includes a scaffold and boatswain's chair.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.2 Standards

(1) A ladder, window cleaner's belt or work platform must meet and be used in accordance with

(a) the applicable CSA or ANSI standard in effect when the equipment or structure was manufactured, except as otherwise determined by the Board,

(b) another standard acceptable to the Board, or

(c) if there is no applicable standard under paragraphs (a) or (b), the requirements of a professional engineer.

(2) In designing and installing a work platform, appropriate safety factors and minimum rated loads must be used in the materials and method of installation, in accordance with

(a) *WCB Standard WPL 1, Design, Construction and Use of Wood Frame Scaffolds, 2004*,

(b) *WCB Standard WPL 2, Design, Construction and Use of Crane Supported Work Platforms, 2004*,

(c) *WCB Standard WPL 3, Safety Factor and Minimum Breaking Strength for Suspended Work Platforms and Associated Components, 2004*, and

(d) *WCB Standard LDR 1, Job Built Ladders, 2004*.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.3 Inspections

A ladder, window cleaner's belt, work platform and associated components must be inspected before use on each shift, and after any modification, and any condition that might endanger workers must be remedied before the equipment is used.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

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Division 2 - Ladders

13.4 Manufactured ladders

A manufactured portable ladder must be marked for the grade of material used to construct the ladder and the use for which the ladder is constructed.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.5 Position and stability

(1) A portable ladder must

(a) be placed on a firm and level surface, and

(b) be of sufficient length to enable the safe performance of the work activity while being used.

(2) A portable non-self-supporting ladder must,

(a) as shown in Figure 13-1, be positioned so that the ladder is leaning against the vertical plane of support at an approximate angle of 75° when measured from the horizontal plane of support,

(b) if the ladder provides access to or egress from an upper landing,

(i) project approximately 1 m (3 ft) above the upper landing, and

(ii) be sufficiently secured in place to ensure the stability of the ladder during access to or egress from the upper landing, and

(c) if the ladder is not already secured in accordance with paragraph (b)(ii), be sufficiently secured in place to ensure the stability of the ladder during use if conditions exist that are likely to cause the ladder to be unstable.

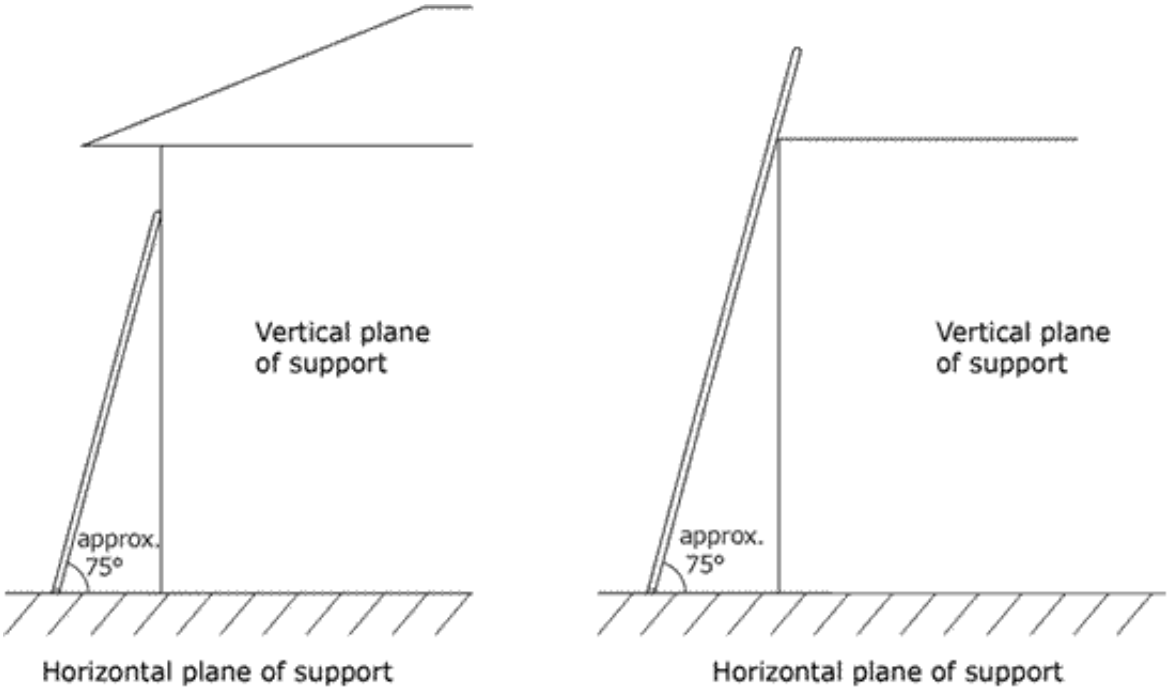

Figure 13-1: Ladder Angle

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

13.6 Use restrictions

(1) If work cannot be done from a ladder without hazard to a worker, a work platform must be provided.

(2) A worker must not carry up or down a ladder, heavy or bulky objects or any other objects which may make ascent or descent unsafe.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

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13.7 Access

Safe access must be provided to every work platform.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.8 General requirements

Each work platform must

(a) have sufficient strength to bear the load to be placed on it, and

(b) be secured against separation from the supporting equipment, structure or surface to which it is attached.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.9 Lines supporting work platforms

Rigging and lines used to suspend or support work platforms must

(a) have sufficient breaking strength to withstand the loads likely to be imposed with the required factor of safety,

(b) be free of knots or splices except for terminal eye-splices,

(c) be suitable for the purpose for which they are used,

(d) be protected from abrasion or other damage from the work environment,

(e) be secured to the platform and to an anchorage able to withstand the loads likely to be imposed on them,

(f) be of sufficient length to lower the work platform to a safe lower landing, and

(g) except for load lines, be used exclusively for suspending the work platform.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.10 Hooks and clamps

(1) Cornice hooks, parapet clamps and thrust-out beams must be secured by tiebacks to a solid anchor on the building or structure.

(2) Tiebacks for cornice hooks, parapet clamps and thrust-out beams must, as nearly as is practicable, be rigged at right angles to the building face.

(3) Each cornice hook, parapet clamp, hanger or stirrup used to support a swing stage must be manufactured of mild steel or other material having similar ductile properties.

(4) Counterweights must be

(a) made of solid material not subject to loss of weight through attrition, and

(b) secured to the thrust-out beam.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.11 Engineering required

(1) A scaffold must be constructed, installed and used in accordance with the instructions of a

professional engineer with respect to

(a) bracing, if the scaffold is enclosed by a tarpaulin or any other cover,

(b) a scaffold exceeding 38 m (125 ft) in height,

(c) a scaffold exceeding 25 m (80 ft) in height if stairways are included as part of the scaffold,

(d) a scaffold used to support a temporary floor,

(e) a scaffold suspended or cantilevered from a structure,

(f) a scaffold system supported by a catenary line,

(g) a needle beam scaffold, and

(h) an outrigger scaffold.

(2) Permanent powered platforms must be constructed, installed and used in accordance with the instructions of a professional engineer.

(3) If a boat is used as a work platform in a pile driving operation, a professional engineer must certify the integrity of the boat for this purpose.

(4) A signed copy of the engineer's instructions or certification referred to in subsections (1) to (3) must be available at the workplace during installation, disassembly and use of the system.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.12 Removal from service

A work platform must be removed from service until certified safe for use by the manufacturer or a professional engineer if it has

(a) been subjected to a sudden drop,

(b) been in contact with exposed energized electrical equipment or conductors, or

(c) shows signs of any kind of structural or mechanical damage or substantial wear.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

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13.13 Responsibilities

The employer must ensure that scaffolds used by workers are in a safe condition and are able to withstand the load, regardless of who erected the scaffold.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.14 Scaffold platforms

(1) The platform of each scaffold must

(a) be a minimum nominal width of 50 cm (20 in), except that a nominal 30 cm (12 in) wide work platform may be used with ladder jacks, pump jack or similar systems,

(b) not leave more than one opening in the work platform, which must be no greater than 25 cm (10 in) in width, and

(c) if not level, be designed to ensure adequate footing for workers using the platform.

(2) Guardrails may be omitted from the edge of a work platform if

(a) the platform is adjacent to a structure that provides protection equivalent to guardrails, and

(b) the open space between the platform and the structure is equal to or less than 30 cm (12 in).

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.15 Manufactured components

Major components of scaffolds must be used in accordance with technical data provided by the manufacturer, or in writing by a professional engineer, that

(a) shows the rated load, erection procedures and compliance with an applicable standard under section 13.2, and

(b) is available at the workplace for reference.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.16 Lumber for structural components

All lumber used to construct a scaffold must be graded and marked to the National Lumber Grades Authority *Standard Grading Rules for Canadian Lumber*.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.17 Scaffold stability

(1) A scaffold must be erected with the vertical members plumb, and with the ledgers and bearers level.

(2) The base of a scaffold must have bearing plates or sills that rest on a solid surface and are sufficient to support the weight of the scaffold.

(3) The poles, legs and uprights of a scaffold must be securely and rigidly braced to prevent movement.

(4) A scaffold must be effectively guyed or secured to a building or structure

(a) if the height of the scaffold exceeds 3 times its minimum base dimension, or

(b) in any other circumstances if required for stability.

(5) Unless otherwise specified by the manufacturer, height adjustment devices must not extend more than 2/3 of their total length or 60 cm (24 in), whichever is less.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.18 Connections

All connections between the parts of a scaffold must be secure.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.19 Electrical hazards

A scaffold must be effectively grounded if

(a) it is a metal scaffold and is located close to a high voltage energized electrical conductor or equipment, and

(b) a hazardous level of electrical charge is likely to be induced in the scaffold.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

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13.20 Marking of equipment

(1) The following equipment must be clearly marked with a rated capacity:

(a) a platform that is suspended from or attached to a crane or hoist,

(b) an elevating work platform,

(c) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(d) a swing stage, and

(e) interchangeable load bearing components of a suspended work platform system.

(2) The rated load for allowable thrust-out beam projections must be clearly marked on a thrust-out beam.

(3) A swing stage platform, counterweight and hoist unit must each be clearly marked with their own weight.

(4) A work platform that is suspended from a crane or hoist or attached to a crane boom must be marked with the weight of the platform and rigging and the rated capacity.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]

13.21 Manuals

(1) For each elevating work platform in use at a workplace,

(a) the equipment manufacturer's operation manual must be available at the workplace, and

(b) the equipment manufacturer's maintenance manual, containing maintenance instructions and replacement part information, must be reasonably available to workers at the workplace.

(2) If either of the manuals required by subsection (1) is not available, the equipment must not be used until

(a) the manual is obtained, or

(b) written instructions for the safe operation and maintenance of the equipment are supplied by a professional engineer.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.22 Maintenance of records

(1) The employer must keep records of inspection, maintenance, repair or modification that meet the requirements of Part 4 (General Conditions) for each

(a) elevating work platform,

(b) swing stage, and

(c) permanent powered platform.

(2) If the inspection and maintenance records, other than pre-shift inspections, are not available, the equipment must not be used until it has been inspected and certified safe for use by the manufacturer or a professional engineer.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.23 Testing

(1) A vehicle-mounted elevating work platform and a self-propelled boom-supported elevating work platform must be

(a) inspected in accordance with good engineering practice at least every 12 months, and

(b) certified in writing by the equipment manufacturer or a professional engineer as complying with this Part and safe for use.

(2) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(3) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(4) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(5) Repealed. [B.C. Reg. 243/2006, effective January 1, 2007.]

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]

13.24 Work platforms on wheels

(1) If a moveable work platform on wheels is not designed for or intended to be moved along the floor or other supporting surface while a person is occupying the platform, the platform must be secured to prevent that movement before a person accesses or occupies the platform.

(2) If a moveable work platform is designed for and intended to be moved along the floor or other supporting surface while a person is occupying the platform, the platform must be moved only in the manner and under the conditions specified by the platform's manufacturer.

(3) Despite subsection (2), if the height of the work platform of a rolling scaffold that is occupied by a person is

(a) not more than one and one half times the least base dimension of the scaffold, the scaffold may be moved by the effort of the person occupying the platform or by the effort of a person on the floor or other supporting surface,

(b) more than one and one half times the least base dimension of the scaffold, the scaffold must be moved only by the effort of a person on the floor or other supporting surface, and

(c) more than two times the least base dimension of the scaffold, the scaffold must not be moved while the person is occupying the platform.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

13.25 Warning devices on elevating work platforms

(1) An elevating work platform, except a vehicle -mounted work platform, must have a warning system consisting of an intermittent horn or flashing light that

(a) is automatically activated during any motion of the work platform, and

(b) can be seen or heard by other workers in proximity to the work platform.

(2) If the safe operation of an elevating work platform requires its carrier vehicle to be on a level surface or level within specified degrees, the platform must be fitted, as the carrier requires, with a device to warn the operator that

(a) the carrier is not level, or

(b) the carrier is outside the permitted degrees from level.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.26 Controls on elevating work platforms

The controls for an elevating work platform must

(a) be clearly identified to indicate their functions,

(b) be "hold-to-run" (continuous pressure) type that return to the neutral or the stop position when released,

(c) be protected against inadvertent operation,

(d) for each set of controls, be provided with an emergency stop device that is

(i) within easy reach of the operator,

(ii) clearly labelled STOP, and

(iii) coloured red, and

(e) include a clearly marked overriding lowering control that will enable a worker at the lower controls to stop and lower the platform in an emergency.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.27 Cranes and hoists used to suspend work platforms

(1) The weight of a work platform suspended from a crane or hoist or attached to a crane boom and its rigging, plus the rated capacity, must not exceed 50% of the rated capacity of the crane or hoist at the working radius or configuration.

(2) If a work platform attached to a crane boom causes eccentric loading on the boom,

(a) the effect on the rated capacity of the crane must be determined and the rated capacity certified by the crane manufacturer or a professional engineer, and

(b) the rated capacity of the crane must be reduced accordingly.

(3) The boom of a crane used to suspend a work platform must have a powered boom or a fixed boom.

(4) A work platform must not be

(a) suspended from an articulating boom crane, or

(b) attached to an articulating boom crane, unless the crane manufacturer approves the installation.

(5) If workers are on a work platform suspended from a crane, a secondary hoisting line on the crane must not be used.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.28 Two-blocking

(1) A crane or hoist used to raise a work platform on a load line must be equipped with

(a) a device to prevent two-blocking at all points, or

(b) in the case of a lattice boom crane, a two-blocking warning device.

(2) Despite subsection (1), a work procedure acceptable to the Board may be followed to minimize the risk of two-blocking if it is not practicable to maintain a two-blocking prevention or warning device on a conventional lattice boom crane used for pile driving and similar applications.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.29 Hoisting and lowering work platforms

(1) Cranes, winches and other devices used for hoisting and lowering movable work platforms must

(a) be operated as slowly as practicable while supporting the work platform,

(b) be lowered under power, if the device is powered, and

(c) not be equipped with a free running boom or hoisting winch controlled only by brakes.

(2) If a moveable work platform is suspended from a crane, winch or other device over a structure that cannot safely support its weight or if other hazards exist below the platform, lower limit travel devices compatible with the hoist system must be used to ensure the platform cannot be lowered beyond the safe lower limit of travel.

(2.1) If the lower limit travel devices required by subsection (2) are not practicable, the employer must ensure that work procedures acceptable to the Board are used that will minimize the risk of the platform going beyond the safe lower limit of travel.

(3) A trial lift for a work platform suspended from or attached to a crane or hoist must be performed at all work locations before the platform is occupied.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 19/2006 effective May 17, 2006.]

13.30 Lift truck mounted work platforms

(1) In this section, *"work platform"* means a movable work platform that is supported by a lift truck.

(2) A work platform may be used to support workers only if other conventional means of access for the task, such as ladders, scaffolds and elevating work platforms, are not practicable.

(3) An employer must ensure that a work platform intended for use by workers was designed, and is used by workers, in accordance with

(a) *ANSI/ITSDF B56.1-2009, Safety Standard for Low Lift and High Lift Trucks*, if the platform is being used with a high lift truck as defined in Part IV of that standard, or

(b) *ANSI/ITSDF B56.6-2011, Safety Standard for Rough Terrain Forklift Trucks*, if the platform is being used with a rough terrain forklift truck as defined in section 2 of that standard.

(4) The employer must ensure that a work platform intended for use by workers is legibly marked in a conspicuous place to show

(a) the name of

(i) the manufacturer of the platform, or

(ii) the professional engineer who certified the platform as having been built to meet the applicable standard referred to in subsection (3),

(b) if the platform was built by a manufacturer,

(i) the model number and serial number, or

(ii) other unique marking or identification that links the platform with the manufacturer's documentation respecting the platform's design and use,

(c) if the platform was custom built, the unique identification number or code that links the platform with the professional engineer's documentation for the platform's design and use,

(d) the title of the safety standard or standards the platform was designed to meet,

(e) the weight of the platform when the platform is empty,

(f) the rated load of the platform, and

(g) the minimum width, as measured in accordance with subsection (5), and minimum rated capacity a lift truck must have to support the platform in a manner that complies with the applicable standard in subsection (3) when the platform is loaded to its rated load.

(5) The width of a lift truck referred to in subsection (4) (g) must be measured in a straight line from any point on the outer part of the right load bearing tire to the corresponding point on the outer part of the left

load bearing tire.

(6) The employer must ensure that a qualified person inspects both the work platform and the lift truck supporting the work platform

(a) each time the platform is mounted on the lift truck, and

(b) at the start of each work shift, if the platform is already mounted on the lift truck at the start of the work shift,

to ensure the platform is properly secured to the lift truck and the lift truck and the platform are safe for use.

(7) The employer must ensure that the inspections referred to in subsection (6) take place before either the work platform or the lift truck is used by a worker.

(8) Only a worker who is qualified and authorized by the employer may operate a work platform, and the lift truck supporting the work platform, for the purpose of supporting workers on the platform.

(9) A worker must not operate either a work platform or the lift truck supporting the work platform unless

(a) there is effective two-way voice communication between the lift truck operator and a worker on the platform who is designated by the employer to provide the lift truck operator with directions for platform movement, and

(b) the lift truck operator and the designated worker on the platform prearrange hand and arm signals, if the voice communication referred to in paragraph (a) relies on the use of a radio or other electronic system, to allow the designated worker to signal the lift truck operator to bring the platform to the ground or floor level in the event the radio or other electronic system fails.

(10) A lift truck operator must remain at the controls of the lift truck at all times there are any workers on the platform supported by the lift truck.

(11) Before a work platform may be used to support workers, the lift truck operator must conduct a trial lift of the platform, with no workers on the platform, to assess the suitability of the surface bearing the weight of the lift truck and whether the platform is clear of all obstructions, unless

(a) the lift truck is on a type of surface the employer has identified as capable of safely supporting the lift truck and the platform when the platform is loaded to its rated load, and

(b) the space in and around which the platform is to be raised is clear of all obstructions.

[Enacted by B.C. Reg. 312/2012, effective February 1, 2013.]

13.31 Powered platforms

If a portable powered platform is raised and lowered by two or more separately controlled hoists operated by one person on the platform, the controls must be located so that they can be used simultaneously by that person.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

13.32 Work in high risk situations

Before a swing stage, boatswain's chair or portable powered platform is used in any of the following circumstances, a professional engineer must have certified in writing that the design, installation and proposed use of the swing stage, boatswain's chair or portable powered platform, as the case may be, meets the requirements of *CSA Standard CAN/CSA Z271-10 Safety code for suspended platforms* and *CSA Standard CAN/CSA Z91-02 (R2008) Health and Safety Code for Suspended Equipment Operations*:

(a) one work platform will be used above or below any portion of another work platform,

(b) a deck or planking will be used to span a gap between two independent work platforms,

(c) the work platform will exceed 10 m (32 ft) in length, or

(d) the suspension height will exceed 91 m (300 ft).

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

[Amended by B.C. Reg. 199/2014, effective February 1, 2015.]

13.33 Fall protection

(1) A person on an elevating work platform must wear a personal fall arrest system secured to a suitable and substantial anchorage point.

(1.1) Despite subsection (1), a person on a scissor lift, or on an elevating work platform with similar characteristics to a scissor lift, that is on a firm level surface with no irregularities to cause platform instability, is exempt from wearing a personal fall arrest system, provided that all manufacturer's guardrails and chains are in place.

(2) If a person is supported on a work platform suspended by fewer than four suspension lines, the person must use a personal fall arrest system secured to an anchor meeting the requirements of Part 11 (Fall Protection) and independent of the work platform and its suspension system.

(3) If a person is supported on a work platform suspended by four or more suspension lines, the person must use a personal fall arrest system secured to an anchor on the platform or to an anchor meeting the requirements of Part 11 (Fall Protection) and independent of the work platform and its suspension system.

(3.1) Despite subsection (3), a person is not required to use a personal fall protection system on an outrigger or suspended mason's scaffold with guardrails on the open sides.

(4) Each person on a work platform suspended from a crane or hoist must use a personal fall arrest system with a shock absorbing lanyard, secured to

(a) an anchor above the load hook, or

(b) an anchor attached to the platform and designated for that purpose by the manufacturer or a professional engineer, provided that the platform has a safety strap that will prevent the platform from falling more than 15 cm (6 in) if the platform becomes dislodged from the hook.

(5) Each person on a work platform attached to a crane boom must use a personal fall arrest system secured to an anchor on the boom or on the platform.

(6) The personal fall arrest system referred to in subsection (5) must be secured on the boom or on the platform to an anchor that is designated by

(a) the manufacturer, or

(b) a professional engineer.

[Enacted by B.C. Reg. 422/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 19/2006 effective May 17, 2006.]

[Amended by B.C. Reg. 243/2006 effective January 1, 2007.]

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

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14.1 Definitions

In this Part

"chimney hoist" means a temporary hoist used for transporting personnel or materials during the construction of a chimney or similar structure;

"construction material hoist" means a material hoist consisting of a guiding and supporting structure and hoist equipment that is not a permanent part of a building, structure, or other work and that is installed and used during construction, alteration, or demolition to raise and lower materials required for the project;

"critical lift" means

(a) a lift by a mobile crane or boom truck that exceeds 90% of its rated capacity while it is lifting the load at a load radius of more than 50% of its maximum permitted load radius, taking into account its position and configuration during the lift,

(b) a tandem lift if the load on any one crane, hoist or other piece of powered lifting equipment exceeds 75% of the rated capacity of that crane, hoist or other piece of powered lifting equipment,

(c) a tandem lift involving the simultaneous use of more than two cranes, hoists or other pieces of powered lifting equipment,

(d) a lift of a person in a work platform suspended from or attached to a crane or hoist,

(e) a lift in which the centre of gravity of the load changes during the lift,

(f) a lift in which the length of one or more sling legs changes during a lift,

(g) a lift by a crane, boom truck or hoist, supported on a floating base, that exceeds 90% of rated capacity for the lifting system,

(h) a lift of a load over or between energized high voltage electrical conductors, or

(i) a lift of a submerged load;

"duty cycle work" means

(a) the use of a crane to do dragline work, clamshell work, dynamic compaction work or pile driving work, including pile extraction using a vibratory pile extraction device, or

(b) the use of a crane with an electromagnet or grapple for the handling of scrap metal and other similar materials;

"load bearing component" means any component that transfers load through a crane or hoist to the surface supporting the crane or hoist;

"miscellaneous material hoist" means a permanently installed material hoist not described elsewhere in this Regulation and not regulated under the *Safety Standards Act*;

"safe working load" means the load a crane or hoist may safely lift in a particular situation taking into account such factors as wind load, extremes of temperature and load sail area, and may be equal to or less than the rated capacity or rated load.

"sign truck" means a truck that is

(a) capable of acting as a crane and as an aerial ladder, and

(b) used as a work platform or used for hoisting loads or accessing a work location;

"tandem lift" means a lift using

(a) more than one crane or one hoist, or

(b) a crane or hoist and another piece of powered lifting equipment.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

14.1.1 Application

(1) This Part applies to a crane or hoist of a type required to meet a standard specified in section 14.2 and to any other equipment with a different primary design function that is being used in a hoisting or lifting application.

(2) Except as otherwise specifically provided, this Part applies to logging equipment that uses a load line for lifting.

(3) This Part does not apply to a front end loader, an excavator or other earth moving equipment that is being used

(a) in applications consistent with its primary design purpose, or

(b) during a lifting task incidental to its primary design purpose if the manuals and operating instructions of the manufacturer of that equipment provide criteria for that lifting task.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

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14.2 Standards

(1) Except as otherwise required by this Regulation, a crane or hoist must be designed, constructed, erected, disassembled, inspected, maintained and operated as specified by the manufacturer or a professional engineer, and to meet the requirements of the applicable standard listed in subsections (2) to (15).

(2) A bridge, jib, monorail, gantry or overhead travelling crane must meet the design requirements for electrical components and functions of *CSA Standard C22.1-94, Canadian Electrical Code, Part 1, Section 40* and *CSA Standard C22.2 No. 33-M1984 (Reaffirmed 1992), Construction and Test of Electric Cranes and Hoists*.

(3) A bridge, jib, monorail, gantry or overhead travelling crane must meet the design requirements of

(a) *ANSI Standard MH27.1-2003, Specifications for Patented Track Underhung Cranes and Monorail Systems*,

(b) *Crane Manufacturers Association of America (CMAA) Specifications for Top Running Bridge & Gantry Type Multiple Girder Electric Overhead Traveling Cranes - No. 70 (2004)*, or

(c) *Crane Manufacturers Association of America (CMAA) Specifications for Top Running and Under Running Single Girder Electric Overhead Cranes Utilizing Under Running Trolley Hoist - No. 74 (2004)*.

(4) A bridge, jib, monorail, gantry or overhead travelling crane must meet the safety requirements of

(a) *CSA Standard B167-96, Safety Standard for Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists, and Trolleys*,

(b) *ANSI Standard ANSI/ASME B30.2-2005, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)*,

(c) *ANSI Standard ANSI/ASME B30.11-2004, Monorails and Underhung Cranes*,

(d) *ANSI Standard ANSI/ASME B30.16-2003, Overhead Hoists (Underhung)*, or

(e) *ANSI Standard ANSI/ASME B30.17-2003, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)*.

(5) A mobile crane, telescoping or articulating boom truck or sign truck must meet the requirements of

(a) *CSA Standard Z150-1998, Safety Code for Mobile Cranes*,

(b) *ANSI Standard ANSI/ASME B30.5-2004, Mobile and Locomotive Cranes*, or

(c) *ANSI Standard ANSI/ASME B30.22-2005, Articulating Boom Cranes*.

(6) A tower, hammerhead crane or self erecting tower crane must meet the requirements of *CSA Standard Z248-2004, Code for Tower Cranes*.

(7) A portal, tower or pillar crane must meet the requirements of *ANSI Standard ASME B30.4-2003, Portal, Tower, and Pillar Cranes*.

(8) A construction material hoist must meet the requirements of *CSA Standard CAN/CSA-Z256-M87, Safety Code for Material Hoists*.

(9) A chimney hoist must meet the requirements of WorkSafeBC Standard 14.116 - Chimney Hoists, set out in Schedule 14-A.

(10) A base mounted drum hoist must meet the requirements of *ANSI Standard ASME B30.7-2001, Base Mounted Drum Hoists*.

(11) A guy, stiffleg, basket, breast, gin pole, Chicago boom, shearleg or A-frame derrick must meet the requirements of *ANSI Standard ASME B30.6-2003, Derricks*.

(12) A side boom tractor used for pipe laying or similar operations must meet the requirements of *ANSI Standard ASME B30.14-2004, Side Boom Tractors*.

(13) A manually lever operated hoist must meet the requirements of *ANSI Standard B30.21-2005, Manually Lever Operated Hoists*.

(14) A patient lift must meet the requirements of *CSA Standard CAN/CSA Z10535-03, Hoists for the Transfer of Disabled Persons-Requirements and Test Methods*.

(15) A crane or hoist of a type not covered by the standards specified in subsections (2) to (14) must meet good engineering practice and be able to safely perform its function.

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

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

14.3 Identification

(1) A crane or hoist must be permanently identified by the legible display of the manufacturer's name, model and serial number on the structure.

(2) Each major interchangeable structural component of a crane or hoist must be uniquely identified and must be legibly marked to enable confirmation that the component is compatible with the crane or hoist.

(3) If a crane or hoist was not commercially manufactured and does not have a model number or serial number, the crane or hoist must not be used unless engineering documentation signed by a professional

engineer, including technical specifications and instructions for use, are available at the workplace where the crane or hoist is being used.

(4) A crane or hoist described in subsection (3) must be identified in a manner that links the engineering documentation referred to in that subsection with that crane or hoist.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.4 Rated capacity

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.5 Rated capacity indication

(1) Subject to subsection (3), the rated capacity of a crane or hoist must be permanently indicated on the superstructure, hoist and load block of the equipment.

(2) The rated capacity of a monorail crane must be permanently marked on the hoist and at intervals not exceeding 10 m (33 ft) on the monorail beam.

(3) If the rated capacity of a crane or hoist is affected by

(a) the vertical or horizontal angle of a boom or jib,

(b) the length of a boom or jib,

(c) the position of a load supporting trolley, or

(d) the use or position of outriggers to increase the stability of the structure,

a load chart must be permanently posted on the crane or hoist or must be issued to the crane or hoist operator who must keep it available at all times when operating the crane or hoist.

(4) A load chart under subsection (3) must indicate the rated capacity for the crane or hoist for the working positions and configurations in use and must be in a legible condition.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.6 Load charts

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.7 Boom angle indicator

A crane or hoist with a boom movable in the vertical plane must have a device to indicate the boom angle if the rated capacity is affected by the boom angle, and the device must be readable by the operator at the control station.

14.8 Boom extension and load radius indicators

A crane or hoist must have a means or device to indicate the boom extension or load radius if the rated capacity of the equipment is affected by boom extension or load radius.

14.9 Logging exemption

Specialized equipment designed and used only for logging operations is exempt from the requirements of sections 14.5 to 14.8.

14.10 Reeved-in devices

The rated capacity of a crane or hoist with reeved-in lifting devices must be the net capacity of the equipment, except for mobile cranes.

14.11 Support structure

(1) The rated capacity of a hoist must not exceed the capacity of the structure supporting the hoist.

(2) Selector switches or other effective means must be provided to ensure that the supporting structure is not overloaded by simultaneous use of multiple hoists installed on the supporting structure.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.12 Manual and instructions

(1) In this section:

"engineer's instructions" mean instructions, approved in writing by a professional engineer, for the assembly, erection, dismantling, maintenance, inspection and operation of the component parts of a crane or hoist and of the assembled crane or hoist.

"manufacturer's manual" means a manual, prepared by the manufacturer of a crane or hoist, that describes the approved methods of assembly, erection, dismantling, maintenance, inspection and operation of the component parts of the crane or hoist and of the assembled crane or hoist.

(2) A crane or hoist must not be used unless the following is reasonably accessible to the equipment operator and other persons inspecting or maintaining the equipment at the workplace where the crane or hoist is to be used:

(a) the manufacturer's manual for the crane or hoist;

(b) if the manufacturer's manual is not available, an engineer's instructions for the crane or hoist.

(3) A crane or hoist must not be used unless the following is readily available at the workplace where the crane or hoist is to be used:

(a) the portions of the manufacturer's manual related to the assembly, erection, dismantling, inspection, routine maintenance and safe operation of the crane or hoist;

(b) if the portions of the manufacturer's manual referred to in paragraph (a) are not available, the portions of an engineer's instructions related to the assembly, erection, dismantling, inspection, routine

maintenance and safe operation of the crane or hoist.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.13 Inspection, maintenance and repair

(1) Each crane and hoist must be inspected and maintained at a frequency and to the extent required to ensure that every component is capable of carrying out its original design function with an adequate margin of safety.

(2) A crane or hoist must not be used until any condition that could endanger workers is remedied.

(3) Any repair to load bearing components of a crane or hoist must be certified by a professional engineer or the original equipment manufacturer as having returned the component to a condition capable of carrying out its original design function with an adequate margin of safety.

(4) Maintenance or repair of a crane or hoist must be done by or under the direct supervision of a qualified person.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.14 Inspection and maintenance records

Records of inspection and maintenance meeting the requirements of Part 4 (General Conditions) must be kept by the equipment operator and other persons inspecting and maintaining the equipment, for

(a) a crane or hoist with a rated capacity of 900 kg (2 000 lbs) or more,

(b) a crane or hoist used to support a worker,

(c) a tower crane,

(d) a mobile crane, boom truck or sign truck,

(e) a side boom tractor or pipe layer,

(f) a construction material hoist,

(g) a chimney hoist,

(g.1) a logging truck trailer reload hoist, and

(h) any other type of hoisting equipment specified by the Board.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.15 Modifications

(1) Each crane or hoist must be erected, dismantled, operated, adjusted, inspected and maintained as specified by the manufacturer's manual unless otherwise approved by the original equipment manufacturer or a professional engineer.

(2) If a modification that affects the rated capacity or safe operation of a crane or hoist is made to its structure, to one of its mechanical components or to its control system, the crane or hoist must

(a) be assessed,

(b) have its rated capacity adjusted as necessary, and

(c) be certified as safe for use.

(2.1) The assessment, rated capacity adjustment and certification under subsection (2) must be carried out

(a) in accordance with the applicable design or safety standard specified in section 14.2, and

(b) by the original equipment manufacturer or a professional engineer.

(3) Modifications to a crane or hoist must be recorded in the inspection and maintenance records system and the equipment operation and maintenance manuals must be revised as necessary to ensure that adequate and appropriate information is available for safe use and maintenance of the equipment.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.16 Certification required

(1) Subsection (2) applies in respect of a crane or hoist if

(a) the origin or rated capacity of the equipment is not available,

(b) the continued safe use of the equipment cannot be assured because of its condition, age or history, or

(c) modifications referred to in section 14.15 that affect the rated capacity have been made to the crane or hoist.

(2) A person must not use a crane or hoist described in subsection (1) unless a professional engineer has certified the rated capacity of the crane or hoist in accordance with the applicable design or safety standard specified in section 14.2.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.16.1 Certification following misadventure

(1) In this section, *"misadventure"* means

(a) a contact with a high voltage electrical source,

(b) a shock load,

(c) a loss of a load,

(d) a brake failure,

(e) a collision or upset, or

(f) any other circumstance that may impair the safe operation of the crane or hoist.

(2) If a crane or hoist has been subject to a misadventure, it must be removed from service until a professional engineer has

(a) supervised an inspection of, and supervised any necessary repairs to, the equipment, and

(b) certified the equipment as safe for use at the manufacturer's rated capacity for the equipment or as provided by section 14.16 if the manufacturer's rated capacity is not available.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.17 Access and egress

(1) A crane or hoist must have a safe means of access to and egress from

(a) the operator's position, and

(b) all maintenance and inspection locations on the crane and hoist.

(2) If the normal safe means of egress is not always available to the operator during crane operations, an alternative safe means must be provided for the operator to get from the operating position to a safe area in the event of a power failure or other emergency.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.18 Audible warning

(1) An effective audible warning device must be installed on a crane or hoist, unless the hoisting equipment is operated using a pendant or remote control and the operator walks in a safe position near the load.

(2) The operator of a crane or hoist must sound a warning signal when it is necessary to alert workers to hoisting operations.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.19 Drop stops

(1) A top-running crane, under-running crane, wheel- or rail-mounted gantry crane, tower crane and monorail hoist must have a means to limit the drop of the crane, trolley and bridge truck frames to 25 mm (1 in) if a tire, wheel or axle fails.

(2) Drop stops must be able to support the trolley, bridge and gantry with the crane or hoist loaded to its rated capacity and must be certified to be able to do so by the original equipment manufacturer or a professional engineer.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.20 Rail end stops

(1) End stops must be provided on crane and hoist tracks and rails to prevent the equipment running off the end of the rail or track.

(2) The stops must contact the truck frame or be of a height of at least 1/2 the diameter of the wheels if the wheels contact the stops.

14.21 Fenders

(1) Fenders must be provided on a crane or hoist which operates on rails if there is a possibility of injury to workers from contact with the equipment wheels moving along the rail.

(2) Fenders required by subsection (1) must effectively deflect any object from the path of the wheel.

14.22 Securing pins

A heel-pin, sheave-pin, shackle-pin or similar device must be secured against inadvertent dislodgment, in the manner specified by the equipment manufacturer or by the professional engineer who designed and certified the equipment.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.23 Boom stops

(1) Positive boom stops must be provided on a crane or hoist with a boom that may fall over backward.

(2) A boom hoist disconnect, shutoff or hydraulic relief must be provided on a crane or hoist to automatically stop the boom hoist when the boom reaches the maximum boom operating angle specified by the manufacturer and before the boom stops are contacted.

(3) A jib on a crane or hoist must be restrained from backward overturning.

14.24 Molten metal

A crane or hoist that handles molten metal must have 2 holding brakes on the hoist mechanism.

14.25 Two-block prevention

Repealed. [B.C. Reg. 19/2006, effective May 17, 2006.]

14.26 Sheave guards

A running line sheave on a crane or hoist must have a device to retain the rope in the sheave groove.

14.27 Ungrounded supply

An electrically powered crane receiving its source of power from an ungrounded supply must have a ground fault indication system that is monitored on a routine basis.

14.28 Controls

(1) Each control for a crane or hoist must have its function clearly identified and must be maintained in good condition.

(2) Each control for a crane or hoist that causes load movement must return to neutral when pressure from the operator is released.

(3) Subsection (2) does not apply to a crane or hoist manufactured before January 1, 2000 for which continuous pressure controls were not previously required.

(4) Each control for a crane or hoist must be located to allow safe operation of the equipment and if the control is not located in a cab it must be located to provide a safe distance between the operator and the load being handled.

(5) A pendant control for a crane or hoist must be supported independently from its electrical conductors.

(6) A remote control panel for a crane or hoist must be designed to safeguard effectively against the unintended activation of the crane or hoist.

(7) A wireless remote control system for a crane or hoist must incorporate

(a) error checking to prevent the controlled equipment from responding to corrupt data, and

(b) identification coding methods to prevent a transmitter other than the designated transmitter for that crane or hoist from operating the equipment.

(8) A remote control system for a crane or hoist must be designed to ensure the following:

(a) if the power to the remote control system is removed for any reason, all crane or hoist functions stop;

(b) if the control signal for any crane or hoist motion becomes ineffective, the crane or hoist motion stops;

(c) the remote control panel has an operator controlled emergency stop feature that

(i) permits the operator to stop all crane or hoist movement regardless of a malfunction within the remote control system, and

(ii) requires resetting of the emergency stop feature before equipment operation can resume.

(9) A remote control panel for a crane or hoist must be marked to identify the corresponding base control unit to be used with it.

(10) The maximum distance between a remote control panel and the crane or hoist being operated by the remote control system must

(a) not exceed the limit specified by the control system manufacturer, and

(b) be communicated to the operator before the operator uses the crane or hoist.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.29 Operator protection

The operator of a crane or hoist must be protected against hazardous conditions such as falling or flying objects and excessive heat or cold that could adversely affect the health or safety of the operator.

14.30 Cab windows

(1) Cab windows on a mobile crane must be made of safety glazing materials meeting the requirements of *ANSI/SAE Z26.1-1990, American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways -- Safety Code*.

(2) Cab windows on a hoist or crane, other than a mobile crane, must be laminated glass, tempered glass, wired glass or clear polycarbonate plastic.

(3) Operator cab windows on a crane or hoist must

(a) be kept clear

(b) provide an unobstructed field of vision toward the load hook, and

(c) have window wipers, if necessary to maintain a clear view through the window.

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

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.31 Operator's seat

The operator's seat on a crane or hoist must be of a design that allows the operator to safely operate the equipment and the seat must be kept in good condition.

14.32 Storage

(1) The operator's cab of a crane or hoist must be kept free of unnecessary tools, material or equipment.

(2) Adequate storage facilities must be provided if it is necessary to keep tools or equipment in the operator's cab of a crane or hoist.

14.33 Fire extinguisher

A fire extinguisher having at least a 10 BC rating must be immediately available in the cab of each crane.

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14.34 Operator qualifications

(1) A crane or hoist must only be operated by a qualified person who has been instructed to operate the equipment.

(2) A person must demonstrate competency, including familiarity with the operating instructions for the crane or hoist and the code of signals for hoisting operations authorized by the Board before operating the equipment.

(3) Repealed. [B.C. Reg. 243/2006, effective January 1, 2007.]

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

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

14.34.1 Operator certification

On and after July 1, 2007, a mobile crane, tower crane or boom truck must be operated only

(a) by a person with a valid operator's certificate issued by a person acceptable to the Board, and

(b) in accordance with any conditions stipulated on the certificate.

[Enacted by B.C. Reg. 243/2006, effective January 1, 2007.]

14.35 Pre-use inspection

(1) Before an operator uses a crane or hoist, the operator must ensure that

(a) the crane or hoist was inspected for that work shift, and

(b) the control and safety devices were tested for that work shift.

(1.1) The inspection and testing in subsection (1) must be carried out in the manner specified

(a) by the manufacturer,

(b) in the applicable design or safety standards set out in section 14.2, and

(c) in this Regulation.

(2) Any defects found during inspection or use of a crane or hoist must be recorded in the inspection and maintenance record system and be reported immediately to the supervisor, who must determine the course of action to be taken.

(3) If a defect affects the safe operation of the crane or hoist, the equipment must not be used until the defect has been remedied.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.36 Load weight

(1) The weight of each load to be hoisted by a crane or hoist must be determined and communicated to the equipment operator and to any person rigging the load.

(2) If the weight of a load to be lifted cannot be accurately determined, the crane or hoist to be used for the lift must have a load weight indicator or an overload prevention system.

(3) Subsections (1) and (2) do not apply to logging equipment that is being used to lift logs or to lift a log trailer.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.37 Calibration

(1) The following devices or systems on a crane or hoist must be calibrated at the intervals specified by the manufacturer and whenever there is an indication the device or system is not functioning correctly:

(a) a load weighing device;

(b) a load moment indicator;

(c) an overload prevention system.

(2) The dates of calibration under subsection (1) must be recorded in the inspection and maintenance records system for the crane or hoist.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.37.1 Operator's duties

The operator of a crane, hoist or boom truck must have full control of the equipment controls whenever the hoisting equipment is in use, and engage in no other duties while operating the equipment.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

14.38 Safe lifting

(1) The rated capacity of a crane or hoist must not be exceeded.

(2) The operator of a crane or hoist must not move a load unless the operator is satisfied that the load can be handled safely.

(3) A load must be secured during a lift to ensure that all or any part of the load cannot be dislodged.

(4) A load line on a crane or hoist must not contact anything other than the load block or hook and the sheaves and hoist drum.

(5) Tag lines or other effective means must be used when necessary to control hazardous movement of a load or to assist with positioning a load.

(6) If a crane or hoist is being operated at the same time and in the same location as other work activity, the employer or the prime contractor must organize and control the work of any persons who are not

involved in that operation to ensure that the operation can be carried out safely.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.39 Contact with loads and structures

(1) A load must not contact a structural member of a crane or hoist and a structural member of a crane or hoist must not contact any building, bridge, other crane or any other structure, fixture or improvement.

(2) If contact as described in subsection (1) occurs, a qualified person must inspect the point of contact, and visible damage such as a cracked weld or a bent or dented member must be assessed, repaired as necessary, and the damaged or repaired area certified by a professional engineer as safe for use.

(3) Equipment used for handling logs and specifically designed for the logs to contact the boom or other structural member is exempt from the requirements of subsections (1) and (2), provided workers are kept out of the hazard area created by the loads being handled.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.40 Swing and shear hazards

(1) If a hazard is created by the swing or shearing movement of a load, cab, counterweight or any other part of a crane or hoist, the operator of the crane or hoist must not move the equipment when a person is within range of the swing or shearing movement of the load or equipment.

(2) If a hazard is created by the swing or shearing movement of a load, cab, counterweight or any other part of a crane or hoist, a person must not enter or remain within the range of the swing or shearing movement of the load or equipment.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.41 Position of equipment

(1) Equipment must be positioned so that no moving part of the equipment will come within 60 cm (2 ft) of any obstruction in any area accessible to workers.

(2) If the clearance required by subsection (1) cannot be provided, entry to such areas must be prevented by barriers or other effective means.

14.42 Tandem lift

(1) If a tandem lift is a critical lift or if the lifted load is to be moved laterally, the tandem lift must be carried out under the direction of a qualified supervisor who

(a) is not operating a crane, hoist or other piece of powered lifting equipment, and

(b) is responsible for the safe conduct of the operation.

(2) A written lift plan must be prepared for every tandem lift and must be available at the worksite during the lift.

(3) The lift plan required in subsection (2) must include the following:

(a) rigging details;

(b) wind speed limitations;

(c) maximum hoist line speed;

(d) maximum crane travel speed, if applicable;

(e) load distribution;

(f) the need for and position of signallers.

(4) If a tandem lift involves the use of a tower crane, the lift plan required in subsection (2) must be certified by a professional engineer.

(5) At a pre-job meeting held immediately before commencing hoisting operations for a tandem lift, the lift plan required in subsection (2) must be communicated to all people involved and the supervisor must document the meeting.

(6) The pre-job meeting required under subsection (5) must be repeated whenever there is a change in the people or equipment involved in the tandem lift.

(7) Effective communication must be established and maintained between all people involved in a tandem lift.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.42.1 Critical lift

(1) A written lift plan must be prepared for every critical lift and must be available at the worksite during the lift.

(2) The written lift plan required in subsection (1) must include the following:

(a) rigging details;

(b) wind speed limitations;

(c) maximum hoist line speed;

(d) maximum crane travel speed, if applicable;

(e) load distribution;

(f) the need for and position of signallers.

(3) At a pre-job meeting held immediately before commencing hoisting operations for a critical lift, the lift plan required in subsection (1) must be communicated to all people involved and the supervisor must document the meeting.

(4) The pre-job meeting required under subsection (3) must be repeated whenever there is a change in the people or equipment involved in the critical lift.

(5) Effective communication must be established and maintained between all people involved in a critical lift.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.43 Travelling with a load

(1) When a crane or hoist is travelling with a load, the operator of the crane or hoist must ensure that the load is carried as close to the ground or grade as possible and rigged to control load swing.

(2) When a crane or hoist is travelling with a load, adequate safety measures must be taken to ensure people are not endangered by the movement of the crane, hoist or load.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.44 Loads over work areas

(1) If practicable, work must be arranged to prevent passing a load over any person.

(2) A crane or hoist operator must not pass a load over a person, unless no practicable alternative exists and then only after the person has been warned of the danger by an audible alarm or other effective means.

(3) A person working at a workplace must not stand under or pass beneath a suspended load.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.45 Unattended loads

A load must not be left suspended from or supported by a crane or hoist when an operator is not at the controls.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.46 Vertical load line

The load line above the load hook or the load block of a crane or hoist must be kept vertical when lifting a load in order to prevent side loading of the crane or the load swinging.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.47 Signals

(1) When the operator of a crane or hoist does not have a clear and unobstructed view of the boom, jib, load line, load hook and load throughout the whole range of the hoisting operation, the operator must act only on the directions of a qualified signaller who has a clear view of the things the operator cannot see.

(2) The operator of the crane or hoist must stop the operation of the equipment on receiving a stop signal from any person.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.48 Alternative to hand signals

(1) Two-way radio or other audio or video systems acceptable to the Board must be used if distance, atmospheric conditions or other circumstances make the use of hand signals hazardous or impracticable.

(2) Audio and video communication systems used in a hoisting operation must be designed, installed, operated and maintained according to a standard acceptable to the Board.

14.49 Dedicated radio system

(1) A two-way radio system used for communications between the operator of a tower crane or a self erecting tower crane and the riggers and signallers working with that operator, must operate on a frequency and at a transmitter power assigned and coordinated by the Board or by a person acceptable to the Board.

(2) Multi-channel radios are not permitted for use to direct crane or hoist movement.

(3) Only the operator of the crane and the riggers and signallers working with the operator may have the capability to transmit on the radio frequency assigned under subsection (1).

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.49.1 Communication between equipment operators

If, during the operation of a crane or hoist, another piece of equipment is operating in the vicinity and has the reach to interfere with the movement of the crane or hoist, or the load being handled,

(a) each operator must have effective voice communication with every other operator, and

(b) written procedures must be developed and implemented to ensure coordination of the operation of the equipment to prevent any physical contact.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.50 Unhooking loads

A load on a crane or hoist load hook must be safely landed and supported, before being unhooked.

14.51 Riding hook or load

A worker must not ride on a load, sling, hook or any other rigging equipment.

14.52 Induced voltage

(1) Before a crane or hoist is operated near a source such as a radio transmitter or energized high voltage electrical equipment which may induce an electric charge which could pose a hazard to workers, the following precautions must be implemented:

(a) the crane or hoist must be effectively grounded;

(b) any induced electric charge on the load must be dissipated by applying grounding cables or by other effective means before workers contact the load;

(c) flammable materials must be removed from the immediate work area.

(2) Subsection (1)(a) and (b) does not apply if work is being performed on a power system in accordance with the requirements of Part 19 (Electrical Safety).

14.52.1 Work near high voltage

A crane or hoist must be operated in a manner that prevents any part of the crane or hoist, load line, rigging or load from coming within the minimum distance of energized high voltage electrical conductors or equipment as specified in Part 19.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.53 High voltage electrical conductors

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

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14.54 Operational and running tests

(1) This section applies to

(a) a bridge crane, gantry crane or overhead travelling crane that was installed after January 1, 1999, and

(b) a crane referred to in paragraph (a) or its runway that has been reinstalled, modified or rebuilt.

(1.1) The following tests must be performed before the equipment described in subsection (1) is used for the first time after it has been installed, reinstalled, modified or rebuilt, as applicable:

(a) all crane motions, holding brakes and travel brakes must be tested to meet the manufacturer's specifications and the requirements of the applicable design or safety standard for when the hook is carrying a load at rated capacity;

(b) all circuits, controls, interlocks and sequences of operation of the equipment must be tested to ensure they are functioning properly;

(c) all crane motions, holding brakes and travel brakes must be tested to prove the crane's ability to safely handle a load of 125% of the crane's rated capacity;

(d) all limit switches, brakes and other protective devices must be tested to ensure they function properly when the crane is carrying a load of 100% of the rated capacity;

(e) structural deflection must be measured with a load of 100% of the rated capacity and must not exceed the allowable deflection specified by the applicable design standard;

(f) the load must be travelled over the full length of the bridge and trolley runways during the load tests at 100% and 125% of rated capacity, and only the parts of runways that have been successfully load tested may be placed into service.

(2) A record of all load tests must be included in the equipment record system giving details of the tests and verification of the loads used, and be signed by the person conducting the tests.

(3) A replacement crane or hoist to be installed on an existing runway may be load tested in the manufacturer's facility and installed on the existing runway provided that the rated capacity of the replacement crane or hoist and the loads imposed on the runway by the replacement crane or hoist are equal to or less than the previously tested load rating for the runway.

(4) In the circumstances set out in subsection (3), the existing runway is not required to be load tested as required in subsection (1.1) unless the runway has been modified since it was previously load tested.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.54.1 Detailed inspection

A bridge crane, gantry crane or overhead crane must be inspected by a qualified person in accordance with

(a) the inspection criteria specified by the manufacturer of the crane,

(b) the applicable design or safety standard specified in section 14.2, and

(c) the requirements of this Regulation.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.55 Uptravel limit

(1) A bridge, gantry or other overhead travelling crane must have a device which will prevent hook travel beyond the safe upper limit at all design hoist speeds.

(2) The device required by subsection (1) must be tested at the beginning of each shift.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.56 Electrical conductors

Electrical conductors for the bridge and trolley must be located or guarded to prevent contact by workers.

14.57 Power shutoff

An electrically powered crane, other than a monorail crane built prior to January 1, 1985, must have a means for the operator to safely interrupt the main electric circuit under any load condition and this means must require a manual reset before power is restored to the crane.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.58 Direction markings

A bridge, gantry, or overhead travelling crane operated by a pendant or remote control must have markings on the crane structure or building, visible to the operator, clearly indicating the direction of hook, bridge and trolley motions compatible with those marked on the controls.

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14.59 Pneumatically powered hoists

(1) The air supply for a pneumatically powered hoist or winch must

(a) be sufficient to safely operate the hoist, and

(b) not exceed the maximum allowable pressure for the operation of the hoist, as specified by the hoist manufacturer.

(2) Air supply hoses for a pneumatically powered hoist or winch must be secured against inadvertent disconnection.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.60 Electric hoists

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

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14.61 Brakes

A manually powered hoist must have a ratchet and pawl, load brake, or other mechanism to hold the load at any height.

14.62 Crank handles

The crank handle for a crank operated winch without automatic load brakes must be

(a) prevented from slipping off the crankshaft while hoisting, and

(b) removed from the crankshaft before the load is lowered.

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14.63 Carrier vehicle

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

14.64 Load weight indicators

(1) A mobile crane or boom truck with a rated capacity of 10 tonnes (11 tons) or more must have a device that measures and indicates the weight of the load on the load hook or disengages crane functions whose movement can cause the mobile crane or boom truck to lift beyond the rated capacity.

(2) A load indicating device required by subsection (1) must meet the requirements of *ANSI/SAE Recommended Practice J376-APR85, Load Indicating Devices in Lifting Crane Service*.

(3) A crane being used for duty cycle work is exempt from the requirements of subsection (1) if the load applied to the crane is safely below the rated capacity of the crane and if the possibility of an unexpected overload does not exist.

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

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.65 Cranes on floating supports

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.66 Level turntable

(1) A mobile crane or boom truck must be operated with the crane turntable or boom truck frame level, unless the manufacturer provides that it may be operated otherwise.

(2) Level indicating devices must be provided to permit the operator of a mobile crane or boom truck to determine whether the crane turntable or boom truck frame is level within the limits specified by the manufacturer.

(3) When a mobile crane or boom truck is operating on a floating support, the rated capacity must be determined by a professional engineer or the manufacturer of the crane or boom truck, taking into account the list and trim characteristics of the floating support and the mobile crane or boom truck operating together as a system.

(4) When a mobile crane or boom truck is used on a floating support, a device to measure the list of the floating support must be provided and located so it can be read by the operator from the operator's position for the mobile crane or boom truck.

(5) A mobile crane or boom truck being used on a floating support must be blocked and secured as necessary to prevent it from shifting relative to the bearing surface of the floating support.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.67 Outriggers and stabilizers

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

(2) Outrigger beams and stabilizers on a crane or boom truck must be marked to indicate when the necessary extension has been achieved.

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

(4) Floats must be secured to the outrigger jacks of a crane or boom truck when outriggers are used.

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

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.68 Tires

Mobile crane or boom truck tire type, condition and inflation must be as specified by the manufacturer when lifting on rubber.

14.69 Supporting surface

(1) A mobile crane or boom truck must be used only on a surface capable of safely supporting the equipment and any hoisted load.

(2) If a mobile crane or boom truck will be used adjacent to an excavation, slope or backfilled area, a qualified person must determine the location for the equipment for hoisting operations.(3) In subsection (2), *"adjacent to an excavation"* has the same meaning as in section 20.1.

(4) Blocking, shoring or cribbing must be sized and used as necessary to ensure the load from a mobile crane or boom truck support does not exceed the bearing capacity of the supporting surface.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.70 Travelling with a load

A mobile crane or boom truck may travel with a suspended load only if

(a) the crane manufacturer specifies load ratings for this operation, and

(b) the operation is carried out in accordance with the manufacturer's instructions for this operation.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.71 Annual inspection

(1) A mobile crane or boom truck must be inspected at least once every 12 months in accordance with good engineering practice to ensure it meets

(a) the crane or boom truck manufacturer's specifications,

(b) the requirements of the applicable design or safety standard specified in section 14.2, and

(c) the requirements of this Regulation.

(2) A mobile crane or boom truck must not be used after an inspection under subsection (1) unless a professional engineer certifies it is safe for use on the basis of that inspection.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.72 Boom inspection

(1) A crane boom used with a vibratory hammer for driving piles must be inspected at least once every 3 months in accordance with good engineering practice to ensure it meets

(a) the crane boom manufacturer's specifications,

(b) the requirements of the applicable design or safety standard specified in section 14.2, and

(c) the requirements of this Regulation,

(2) A crane boom used with a vibratory pile extractor or with a drop hammer or used for dynamic compaction must be inspected at least once a month in accordance with good engineering practice to ensure it meets

(a) the crane boom manufacturer's specifications

(b) the requirements of the applicable design or safety standard specified in section 14.2, and

(c) the requirements of this Regulation

(3) A boom must not be used after an inspection under subsection (1) or (2) unless a professional engineer certifies it is safe for use on the basis of that inspection.

(4) A crane used in any operation described in subsection (1) or (2) must not be returned to lifting service unless a professional engineer inspects the crane and certifies that it is safe for such use.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.73 Sign trucks

(1) A sign truck must be inspected, maintained and operated according to the requirements for mobile cranes, and for elevating work platforms in Part 13 (Ladders, Scaffolds and Temporary Work Platforms).

(2) When a sign truck is being used, the load rating charts for the configuration in use must be available at the workplace.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

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14.73.1 Definition

In sections 14.73.2 to 14.93, *"tower crane"* means a tower crane that is erected on site from component parts or that is self erecting.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.73.2 Tower crane erection

The erection, climbing and dismantling of a tower crane must be done by qualified persons and in accordance with the instructions of

(a) the crane manufacturer, or

(b) a professional engineer, if the installation varies from the crane manufacturer's instructions.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.74 Tower crane support

(1) The foundation for support of a tower crane must be certified by a professional engineer.

(2) The design of shoring and bracing to support a tower crane must be certified by a professional engineer, and the shoring and bracing must be constructed as specified by the design.

(3) If a tower crane is supported partially or fully by, or connected to, a building or structure, the connections to and any bracing or shoring of the building or structure necessary to support the tower crane must be certified by a professional engineer.

(4) The bearing capacity of the supporting surface for a tower crane must be determined by a professional engineer.

(5) The loads from a tower crane must be distributed onto its supporting surface to prevent the bearing capacity of the supporting surface being exceeded.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.75 Before use

(1) Before a tower crane is put in service, the erector of the tower crane must verify that the crane has been erected according to

(a) the manufacturer's specifications, or

(b) the specifications of a professional engineer, if the engineer has authorized the crane to be erected otherwise.

(2) If a tower crane is not erected according to the manufacturer's specifications a professional engineer must certify before the crane is put in service that

(a) the variations from the manufacturer's specifications meet the requirements of the applicable design or safety standard,

(b) the load charts are adjusted as necessary, and

(c) the crane is safe for use.

(3) The erector of a tower crane must adjust the overload prevention system as necessary to meet the load chart for the crane as erected.

(4) Before a tower crane, other than a self erecting tower crane, is put in service after its mast has been repositioned, a professional engineer must certify that the parts of the crane affected by the repositioning process have been properly installed and any required reshoring for, and bracing to, the supporting structure is in place.

(5) Before a tower crane is put in service following its erection or the repositioning of its mast, the person responsible for the erection of the crane or the repositioning of its mast must make available at the workplace where the crane is installed a report verifying that

(a) the certification documents required by section 14.74 and subsections (2) and (4) of this section are available at the workplace, and

(b) the overload prevention system of the crane has been adjusted as required in subsection (3), including specifying the load limits set for the various devices.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.76 Identification

The interchangeable structural components of tower cranes must be uniquely identified and that unique identification must be used when referring to structural components in reports for inspection and testing, and certifications for repairs and modifications.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.77 Structural inspection

(1) Subject to subsection (4), before the erection of a tower crane, the structural components of the crane must be

(a) inspected to determine their integrity by a qualified person using non-destructive testing (NDT) methods meeting the requirements of the Canadian General Standards Board (CGSB), and

(b) certified by a professional engineer as safe for use after the inspection in paragraph (a) and any necessary repairs.

(2) If a tower crane remains erected at a workplace for more than 12 months,

(a) its structural components must be inspected to determine their integrity by a qualified person using NDT methods meeting the requirements of the CGSB, and

(b) after the inspection required by paragraph (a), the crane, including any necessary repairs, must be certified by a professional engineer as safe for use.

(3) If a tower crane is scheduled to be dismantled within 15 months of its being erected, subsection (2) does not apply provided that a visual inspection, conducted 12 months after erection of the crane and supervised by a professional engineer, shows no evidence of cracking or other structural weakness.

(4) A self erecting tower crane must be

(a) inspected visually by a qualified person each time it is erected, and

(b) inspected and certified under subsection (1) at least once every 12 months.

(5) Subsection (3) does not apply to a self erecting tower crane.

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

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.78 Structures kept clean

Tower crane structures must be kept clean and free of concrete and other debris that can hinder

inspection and the base area must be clear of debris and the accumulation of water.

14.79 Manual and records

The following documents respecting operation, inspection, maintenance and repair of a tower crane must be kept at the workplace where and while the crane is erected:

(a) the portions of the manufacturer's manual or engineer's instructions required by section 14.12 (3);

(b) all records dated from the date of structural certification under section 14.77, including those specified in section 14.75 (5);

(c) in the case of a self erecting tower crane, all records dated from the date of the last certification of the crane.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.80 Counterweights and ballasts

(1) Counterweights and ballasts used on a tower crane must be as specified by the original equipment manufacturer or by a professional engineer.

(2) Each counterweight and ballast element must be accurately weighed and the weight of the counterweight or element must be clearly and durably marked on it.

(3) The weight of counterweight and any ballast installed on a tower crane must be recorded in the report required by section 14.75 (5).

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.81 Limit devices

(1) A tower crane must have automatic travel limit switches and automatic overload prevention devices that prevent overloading at any trolley position, the load block from travelling beyond the highest allowable position specified by the manufacturer and the trolley from travelling beyond the allowable limit specified by the manufacturer.

(2) Subject to subsection (4), limit devices on a tower crane must be tested before the crane is first used on each work shift.

(3) Any malfunction of an automatic limit or safety device on a tower crane must be remedied before the crane is used.

(4) If it is not practicable, due to the configuration of the workplace, to position sufficient test weights to test the maximum load limit switch before the crane is first used on each work shift, the maximum load limit switch must

(a) be set to activate at a load of less than 80% of the maximum rated capacity for the crane and tested using test blocks, and

(b) be reset to the maximum load limit for the crane and tested using test blocks before making any lift that is greater than the load limit setting established under paragraph (a).

(5) A tower crane with a luffing boom must have an automatic limit device that prevents the boom being raised beyond the maximum permitted boom angle.

(6) In subsection (5), *"luffing boom"* means a boom that is raised and lowered about a pivot point to change the load radius.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.82 Test blocks

(1) Test blocks for testing overload prevention devices on a tower crane must be available at the tower crane site.

(2) The weights of test blocks required by subsection (1) must be as specified by

(a) the crane manufacturer if the crane is erected in accordance with the manufacturer's instructions, or

(b) a professional engineer if the crane has been erected other than in accordance with the manufacturer's instructions.

(2.1) The weight of each test block required by subsection (1) must be accurately determined and durably and legibly marked on that block.

(3) Test blocks, including the lifting point, must be designed by the crane manufacturer or a professional engineer.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.83 Operator's cab

(1) The design, location and method of attaching a tower crane operator's cab must be approved by the crane manufacturer or by a professional engineer.

(2) The rated capacity of a tower crane must be adjusted as necessary if using a cab type and location not approved by the crane manufacturer.

14.84 Monitoring jib swing

(1) The operator of a tower crane must have a clear view of the jib of the crane whenever the jib is being slewed.

(2) Subsection (1) does not apply if a signaller or a rigger who is able to see the jib of the crane is in communication with the operator of the crane and provides directions to the operator.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.84.1 Overlapping operating zones

(1) In this section:

"operating zone" means,

(a) in the case of a tower crane, the complete circular area covered by the swing of the tower crane's jib as it rotates, and

(b) in the case of any other equipment, the area covered by the swing or movement of the equipment;

"overlapping operating zone" means the area where the operating zone of a tower crane intersects the operating zone of another tower crane or other piece of equipment.

(2) If practicable, tower cranes must be erected to avoid the overlapping of their operating zones.

(3) If it is not practicable to comply with subsection (2), the following procedures apply:

(a) the cranes must be erected and maintained so that the lowest point of any component of the higher crane is at least 3 m (10 ft.) above the highest component of the lower crane that crosses into the overlapping operating zone;

(b) the boundaries of the overlapping operating zone must be marked so the boundaries are visible to the operators of all the affected cranes;

(c) any load suspended by the higher crane must be positioned at a location that ensures at least 3 m (10 ft.) lateral clearance between it and an operator's cab on the jib of the lower crane;

(d) written operating procedures must be developed and implemented to coordinate lifting tasks in the overlapping operating zone to prevent collision or interference between a component or suspended load of one crane with a component or suspended load of another crane.

(4) The procedures required in subsection (3) (d) must do the following:

(a) minimize the time each crane spends in the overlapping operating zone;

(b) establish that the lower crane has priority for working in the overlapping operating zone;

(c) establish that the operator of the lower crane must give temporary permission to the operator of the higher crane for each lifting sequence in the overlapping operating zone;

(d) establish a means and protocol for communication between the crane operators when a crane operates in the overlapping zone, including a requirement for the operator of the higher crane to contact the operator of the lower crane when the higher crane is required to enter the overlapping operating zone;

(e) establish that the lateral clearance of the load of the higher crane will be at least 3 m (10 ft.) from

(i) the occupied cab of the lower crane, and

(ii) the space above it;

(f) establish that when the lower crane is being operated or when a person is on the lower crane, the higher crane will not pass a load over the lower crane unless

(i) the activity follows work procedures acceptable to the Board and

(ii) either

(a) the higher crane is being used to erect, service or dismantle the lower crane, or

(b) there is a minimum of 18 m (60 ft.) clearance between the underside of the jib of the higher crane and the highest point on the lower crane that is within the tip radius of the higher crane.

(5) If the operating zone of a tower crane overlaps the operating zone of another piece of equipment with a reach capable of interfering with the movement of the crane or hoist, or the load being lifted

(a) written operating procedures must be developed and implemented to coordinate lifting tasks in the overlapping operating zone to prevent collision or interference between a component or suspended load of the tower crane with a component or suspended load of the other equipment, and

(b) the boundaries of the overlapping operating zone must be marked so the boundaries are visible to the operators of all affected cranes and equipment.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.85 Clearance and freedom to slew

(1) Except as otherwise required by this Regulation, at all times and under all load conditions, a tower crane must have vertical and lateral clearances, between any component of the tower crane jib and counter jib and any obstruction, that are the greater of

(a) the vertical and lateral clearances specified by the crane manufacturer, and

(b) a vertical clearance of 1 m (3.3 ft.) and a lateral clearance of 30 cm (1 ft.).

(2) At all times and unless otherwise specified by the crane manufacturer, a tower crane must be able to slew 360 degrees.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.86 Freedom to slew

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

14.87 Communication

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.88 Access

(1) A tower crane must have a fixed ladder installed in or on the mast to provide access to the jib and crown of the crane.

(2) The ladder under subsection (1) must meet the following requirements:

(a) the ladder must be able to support two 1.1 kN (250 lbs.) point loads between any two consecutive

points where the ladder is attached to the crane;

(b) there must be a minimum horizontal distance of 15 cm (6 in.) between the rungs and the object to which the ladder is attached;

(c) landing platforms must be provided at least every 9 m (30 ft.) on the ladder;

(d) each section of the ladder must be offset horizontally from adjacent sections or the landing platforms must have trap doors;

(e) if a section of the ladder has a climb exceeding 6 m (20 ft.) in length, that section of ladder must have a ladder safety cage 68 cm to 76 cm (27 in. to 30 in.) in diameter or a ladder safety device must be used.

(3) Each tower crane jib must have a continuous walkway from the mast to the tip.

(4) The walkway referred to in subsection (3) must meet the following requirements:

(a) the walkway must be at least 30 cm (12 in.) wide and constructed with a non-skid surface;

(b) a handline, which is approximately 1 m (39 in.) above the level of the walkway, and a midline must be provided on both sides of the walkway not more than 30 cm (12 in.) out from the edge of the walkway and supported at intervals not exceeding 3 m (10 ft.);

(c) the handline and midline referred to in paragraph (b) must be wire rope of at least 1 cm (3/8 in.) diameter;

(d) if it is not practicable to provide handlines in accordance with paragraph (b), alternative means of fall protection, such as a horizontal lifeline system, must be provided in accordance with the requirements of Part 11 (Fall Protection) and must be set out in the fall protection plan.

(5) If, due to the design or size of the tower crane, it is not practicable to meet the requirements set out in subsections (1) to (4), alternative safe means of access must be provided.

(6) The climbing space of a tower crane mast must be clear of protruding objects and must provide a safe and unobstructed passage.

(7) A written fall protection plan, which addresses the requirements of fall protection when a person is operating, inspecting, servicing and maintaining the tower crane, must be developed and implemented.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.89 Jib access

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.90 Unobstructed passage

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.91 Hoisting ropes

(1) A rotation resistant hoisting rope on a tower crane must be shortened by the removal of 3 m (10 ft) of rope at the dead end after every 500 hours of use unless

(a) otherwise specified by the rope manufacturer,

(b) the rope has 14 or more outer strands, or

(c) the rope has a plastic coated inner core.

(2) The hoisting rope on a tower crane must be properly seized before cutting.

(3) The equipment records for a tower crane must contain the following information about the hoisting rope installed on the crane:

(a) the name of the manufacturer or supplier of the rope;

(b) the type of rope installed as described by the rope construction, number of outer strands, type of lay, direction of lay and type of core;

(c) the diameter and the length of the rope;

(d) the nominal or minimum rated breaking strength of the rope;

(e) the rated working load limit for the rope;

(f) the date the rope was installed;

(g) if the rope was not new at the time of installation, the name of the qualified person who inspected the rope before installation on the crane to ensure that the rope was in a suitable condition for use as the hoist line on the crane;

(h) the name of the qualified person who installed the rope.

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.92 Wind limitations

(1) An anemometer must be mounted on the crown, apex or operator's cab of each tower crane.

(2) The readout for the anemometer required by subsection (1) must be readable by the operator while at the crane controls.

(3) Tower crane operations must stop when a load cannot be handled safely because of wind.

(4) In the absence of the manufacturer's specifications for maximum permitted wind speed during crane operation, the maximum allowable wind speed in which a tower crane may be used is 50 km/h (30 mph), or less if a load cannot be handled safely because of wind.

(5) A sign or other item that would increase the surface area of a crane structure exposed to wind must not be installed unless authorized by the crane manufacturer or a professional engineer.

(6) A tower crane must not be erected, operated or dismantled when the wind speed exceeds the upper limit specified by the crane manufacturer for erection, operation or dismantling of the crane.

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

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.93 Temperature limitations

Tower crane operations must stop when the ambient temperature drops below -18°C (0°F) or as otherwise specified by the crane manufacturer or a professional engineer.

14.94 Counterjib

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

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14.95 Standards

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

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14.96 Certifications and instructions

(1) Before a construction material hoist is put into use, a professional engineer must certify that

(a) the hoist is safe for use, and

(b) the installation of the hoist complies with

(i) the design criteria for that installation,

(ii) the hoist manufacturer's specifications,

(iii) the requirements of *CSA Standard CAN/CSA-Z256-M87, Safety Code for Material Hoists*, and

(iv) the requirements of this Regulation.

(2) If, after certification under subsection (1), a modification is made to the structure, mechanical components or control system of a construction material hoist or it is changed through the addition or removal of a support section of the hoist, the hoist must not be used until it is recertified as safe for use by a professional engineer.

(3) Subsections (1) and (2) do not apply to a light duty portable material hoist installed and operated in accordance with the hoist manufacturer's instructions.

(4) A copy of the certifications required in subsections (1) and (2) or the manufacturer's instructions referred to in subsection (3) must be available at the workplace where the hoist is installed.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

14.97 Rider restriction

A worker must not ride on a construction material hoist unless it is necessary to do so for inspection and maintenance of the hoist.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

14.98 Notices

(1) The net rated capacity of each construction material hoist must be clearly and durably marked upon the hoist structure in letters or figures at least 5 cm (2 in) high in a location which is visible to persons involved with operation of the hoist.

(2) Each construction material hoist must prominently display a notice stating that no person may ride on the equipment.

14.99 Gate interlock systems

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.100 Hoistway entrances

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.101 Hoist platform

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.102 Hoist runway

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.103 Ratchets and pawls

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.104 Electric brakes

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.105 Emergency devices

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.106 Travel and load limit switches

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.107 Erection and maintenance

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.108 Operator qualifications

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.109 Operator responsibilities

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.110 Inspection

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.111 Testing safety and control devices

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.112 Securing the platform

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.113 Signal systems

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.114 Operating signals

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.115 Operating restrictions

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

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14.116 Standard to use

If it is not practicable to provide safe access to a work platform on a chimney or similar structure using stairs or other means acceptable under the *BC Building Code* or this Regulation, a chimney hoist meeting the requirements of WorkSafeBC Standard 14.116 - Chimney Hoists, set out in Schedule 14-A, may be used to provide access for any person.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

14.117 Certification

(1) Before a chimney hoist is used, a professional engineer must certify that

(a) the chimney hoist is safe for use, and

(b) the installation of the hoist complies with

(i) the design criteria for that installation,

(ii) the hoist manufacturer's specifications,

(iii) the requirements of WorkSafeBC Standard 14.116 - Chimney Hoists, set out in Schedule 14-A, and

(iv) the requirements of this Regulation.

(2) A copy of the certification required in subsection (1) must be available at the workplace where the chimney hoist is installed.

[Enacted by B.C. Reg. 320/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

14.118 Support structures

The structure supporting a chimney hoist, together with all hoisting gear and equipment, must be well constructed, accurately aligned, securely anchored and have the required strength and stability to safely withstand the loads imposed.

14.119 Load rating

The rated capacity of the hoist of a chimney hoist must be conspicuously marked on the hoist and must not be exceeded.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

14.120 Emergency brakes

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.121 Safety factors

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.122 Drive restrictions

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.123 Brakes

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.124 Limit switches

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.125 Speed governor

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.126 Hoisting speed

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.127 Guardrails and gates

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.128 Raising materials

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.129 Communication

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.130 Fall protection

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.131 Operator qualifications

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

14.132 Unattended controls

Repealed. [B.C. Reg. 320/2007, effective February 1, 2008.]

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(sections 14.2(9), 14.116 and 14.117)

WorkSafeBC Standard 14.116 — Chimney Hoists

1 Scope

1 This standard sets out the minimum requirements that are in addition to those set out in sections 14.116 to 14.119 of this Regulation for the design and use of a chimney hoist to transport personnel to a fixed work platform on a chimney or similar structure.

2 Definitions and interpretation

(1) In this standard:

"cage" means the fully enclosed platform of a chimney hoist, which platform is used to raise or lower one or more persons to a fixed work platform on a chimney or similar structure;

"hoist", in respect of a chimney hoist, means the apparatus that is used to raise or lower the cage;

"rated capacity", in respect of a cage or a hoist, means the maximum weight the cage or hoist is rated by its manufacturer to carry.

(2) The definitions set out in ANSI/ASSE Standard A10.22-2007, *Safety Requirements for Rope-Guided and Non-Guided Workers' Hoists*, apply in this standard.

3 General Requirements

(1) A chimney hoist must

(a) be designed, constructed, erected, disassembled, inspected, maintained and operated as specified by the manufacturer or a professional engineer, and

(b) meet the requirements of ANSI/ASSE Standard A10.22-2007, *Safety Requirements for Rope-Guided and Non-Guided Workers' Hoists*, except as otherwise specified in this standard.

(2) A chimney hoist must have a cage.

4 Certification after alteration

(1) Following any alteration to a chimney hoist, other than ordinary adjustments or repairs,

(a) the chimney hoist must be tested by a professional engineer and certified as required under section 14.117 of this Regulation, and

(b) the design documents and operating instructions must be updated by the professional engineer as necessary to ensure the documentation is complete and allows for safe use of the chimney hoist.

(2) A copy of the certification required under subsection (1) must be available at the workplace where the chimney hoist is installed.

5 Emergency stopping devices

A chimney hoist must be outfitted with emergency stopping devices on at least two separate guide wire ropes that will apply automatically to prevent the cage from falling if a wire rope fails

6 Safety factors

Suspension and guide wire ropes, supporting structures, slings and metal fittings used on a chimney hoist must have a safety factor of 10.

7 Drive restrictions

A hoist must have a positive drive and there must not be a clutch between the transmission and the hoist drum.

8 Brakes

A hoist must have two independent braking systems: one that applies automatically when the controls are in the neutral position, and one that applies automatically in the event of loss of power.

9 Terminal stopping devices

A chimney hoist must have upper and lower terminal stopping devices that automatically stop the cage from normal travel speed within the top and bottom travel limits

10 Speed governor

A hoist must have a governing device that will effectively prevent the drum speed from exceeding 110% of the design speed.

11 Equipment condition

The hoist, wire ropes and cage of a chimney hoist must be in good working order with all components, controls and functions meeting, and operating in accordance with, the manufacturer's specifications, the professional engineer's design specifications and this Regulation.

12 Cage markings

The cage must be legibly marked to show

(a) the name of the manufacturer or certifying professional engineer,

(b) a unique identification number or code that links to the design and certification documentation for the chimney hoist from the certifying professional engineer,

(c) the weight of the cage, and

(d) the rated capacity of the cage.

13 Load restrictions

(1) The rated capacity of the cage must not be exceeded.

(2) A chimney hoist must not use a hoist with a rated capacity that is less than the rated capacity of its cage.

14 Cage layout and guarding

The cage must be constructed so that

(a) it does not cause a hazard to the occupants, and

(b) the occupants cannot reach any hazard created by movement of the cage or the hoisting mechanism.

15 Fall protection at landings

A landing that is 3 m (10 ft) or more above grade must have gates, hinged guardrails, hinged covers or other effective guarding that protects persons who are at or near the landing from the hazard of falling off of or through the landing platform when the cage is not at that landing.

16 Guarding at the lower landing

The lower landing for a chimney hoist must be guarded by perimeter guards or guardrails and a gate.

17 Instructions for use and maintenance

The instructions from the professional engineer who designed the chimney hoist and from the manufacturers of its component parts, relating to safe use and maintenance of the chimney hoist, must be available in the workplace.

18 Chimney hoist must be in good condition

The chimney hoist, including its cage, must be in good condition at the beginning of each shift and during use.

19 Operator training and authorization

(1) A chimney hoist operator must not operate a chimney hoist unless authorized by the employer.

(2) A chimney hoist operator must not be authorized under subsection (1) unless the operator has demonstrated

(a) competency in operation of the chimney hoist, and

(b) familiarity with the operating instructions required under section 17 and the communication systems required under sections 22 and 23.

20 Daily testing

Before the first use on each work shift, the cage of the chimney hoist must be raised to its maximum operating height and lowered back to the ground or base to ensure that

(a) all functions are operating correctly,

(b) all limit devices are functioning properly, and

(c) there is adequate clearance between the cage and any surrounding object such as a structure, overhead obstruction, storage rack, or scaffold, and any hazard such as energized electrical wires and equipment.

21 Attending the controls

The operator of a chimney hoist must not leave the hoist controls unattended or engage in any other tasks unless the cage is at the lowest landing level, which is usually at ground or grade level, and no persons are in the cage.

22 Communication with the operator

(1) There must be effective voice communication, using single channel two-way radios, among the chimney hoist operator, occupants of the cage and people at each hoist landing.

(2) If there is more than one occupant in a cage, one person in the cage must be designated to be the primary person to signal the chimney hoist operator regarding cage movement requests.

23 Backup communication plan

(1) An effective signalling system must be developed and implemented as an alternative in the event the primary voice communication system becomes ineffective while the chimney hoist is in use.

(2) If the voice communication system becomes ineffective while the chimney hoist is in use, the signalling system required under subsection (1) must be used to bring the cage down to the lowest landing and the hoist must not be used until the voice communication system is effectively restored.

24 Persons or materials

Materials, equipment or supplies must not be raised or lowered by the chimney hoist with a person in the cage.

25 Getting in or out of the cage

The cage must be at a designated landing before a person gets into or out of the cage.

26 Hoisting speed

A cage must not be raised or lowered at a speed greater than 76 m/min (250 fpm).

27 Position of gates

All the gates of a chimney hoist must be kept closed, except at a landing designated for loading and unloading the cage.

28 Emergency evacuation

(1) Before a chimney hoist is used, a plan must be developed for the evacuation of personnel from the cage in the event of loss of power or equipment malfunction.

(2) While a chimney hoist is in use, personnel and equipment must be immediately available to implement the plan required under subsection (1).

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

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Part 15 Rigging

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GENERAL REQUIREMENTS

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In this Part

"design factor" means the theoretical reserve capability of a product, usually determined by dividing the breaking strength by the working load limit;

"proof test" means a test applied to a product to determine material or manufacturing defects;

"rigging" means fibre ropes, wire ropes, chains, slings, attachments, connecting fittings and associated components;

"working load limit" or *"WLL"* Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

* See section 1.1 of the OHS Regulation.

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

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15.2 Qualified riggers

Rigging and slinging work must be done by or under the direct supervision of qualified workers familiar with the rigging to be used and with the code of signals authorized by the Board for controlling hoisting operations.

15.3 Detaching loads

Loads to be unhooked by a worker must be safely landed and supported before the rigging is detached.

15.4 Use of rigging

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

(2) The load applied to any rigging or rigging assembly must not exceed the working load limit.

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

15.5 Component identification

(1) Rigging fittings must be marked with the manufacturer's identification, product identifier and the working load limit or sufficient information to readily determine the WLL.

(2) The WLL of existing fittings not identified as specified in subsection (1) must be determined by a

qualified person, marked on the fitting and such fittings must be removed from service by January 1, 2001.

15.6 Design factors

(1) The design factors based on breaking strengths for rigging components must be at least equal to the values given in Table 15-1, except as otherwise specified in this Regulation.

Table 15-1: Minimum Design Factors for Rigging

Item	Component	Minimum design factor
1	Nylon fibre rope sling	5
2	Polyester rope sling	5
3	Polypropylene rope sling	5
4	Alloy steel chain sling	4
5	Wire rope sling	5
6	Metal mesh sling	5
7	Synthetic web sling	5
8	Synthetic roundsling	5
9	Chain fittings	4
10	Wire rope sling fittings	5
11	Other fittings	as specified by manufacturer
12	Non-rotating wire rope	as specified by manufacturer but not less than 5
13	Conventional wire rope	5

(2) The design factors specified by subsection (1) may be reduced for a dedicated rigging assembly designed and certified by a professional engineer for a specific lift, but the dedicated assembly must be re-rated according to the requirements of subsection (1) for continued use.

(3) The design factor for any rigging assembly used to support workers must be at least 10.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

15.7 Wire rope on mobile cranes

The minimum design factor based on breaking strength for wire rope on a mobile crane, unless otherwise specified by the crane or wire rope manufacturer, is

(a) for conventional wire rope

(i) 2.5 for pendant lines, 3 for boom hoist reeving and 3.5 for load lines, during erection, and

(ii) 3 for pendant lines, 3.5 for boom hoist reeving and 3.5 for load lines, at all times except during

erection, and

(b) 5 for wire rope of nonrotating construction.

15.8 Natural fibre rope

Natural fibre rope must not be used for hoisting with a powered hoist.

15.9 Wedge socket connections

If a wedge socket is used as a wire rope termination, the dead end of the rope must be secured to prevent release of the wedge or rope slippage at the socket.

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

15.10 Open hook restriction

(1) A hook must have a safety latch or other means that will retain slings, chains, or other similar parts, under slack conditions.

(2) A hook used in an application where manipulation of a safety latch or other retaining means may cause a hazard to a worker or where there is no hazard to a worker if the load becomes dislodged is exempt from the requirements of subsection (1).

15.11 Securing pins

(1) A shackle-pin, heel-pin and similar device must be secured against dislodgement.

(2) The pin in a screw-pin type shackle must be wired or otherwise secured against rotation when used in applications that may cause the pin to loosen.

15.12 Replacing pins

A shackle-pin must not be replaced with a bolt or other makeshift fitting.

15.13 Wire rope lubrication

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

15.14 Securing ropes to drums

(1) A rope must be secured to its winding drum, unless the line is required to automatically disengage from the drum.

(2) A rope must not be fastened to a drum by a knot tied in the rope.

15.15 Wraps required

At least 2 full wraps of rope must remain on winding drums when the load hook is in the lowest position.

15.16 Reeving lines

Pulling and pulled lines must be connected by a suitable splice, or a cable pulling sock must fully enclose both line ends whenever a worker may be endangered by failure of the connection between the two lines while reeving lines through sheaves or blocks.

15.17 Sheaves

A sheave must

(a) be correctly sized for the rope,

(b) have a device to retain the rope within the groove, and

(c) be removed from service if it has a damaged groove or flange.

15.18 Guylines

(1) The strength of each guyline and its anchor must exceed the breaking strength of the load-line rigging arrangement.

(2) A guyline anchor must be placed so that the interior angle, between the guyline and the horizontal plane, does not exceed 45°.

(3) Guylines must be arranged so that the hoisting line pull in any direction is shared by 2 or more guys.

(4) Guylines and anchor systems, if certified by a professional engineer, may deviate from the requirements of subsections (1) to (3).

15.19 Spooling rope

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

(2) Except as provided in subsection (3), workers must not use their hands or feet or any hand held object to guide the rope when spooling the rope onto a drum.

(3) In an emergency a steel guide bar of acceptable design may be used to guide the rope onto the drum, but the line speed must be kept as low as practicable and the worker must be positioned to be clear of the drum.

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

15.20 Hand signals

If hand signals are used between a signaller and the operator of a crane or hoist to control hoisting

operations, the signals shown in Figure 15-1 must be used.

Figure 15-1:
Standard hand signals for controlling crane operations -- crawler, locomotive and truck cranes

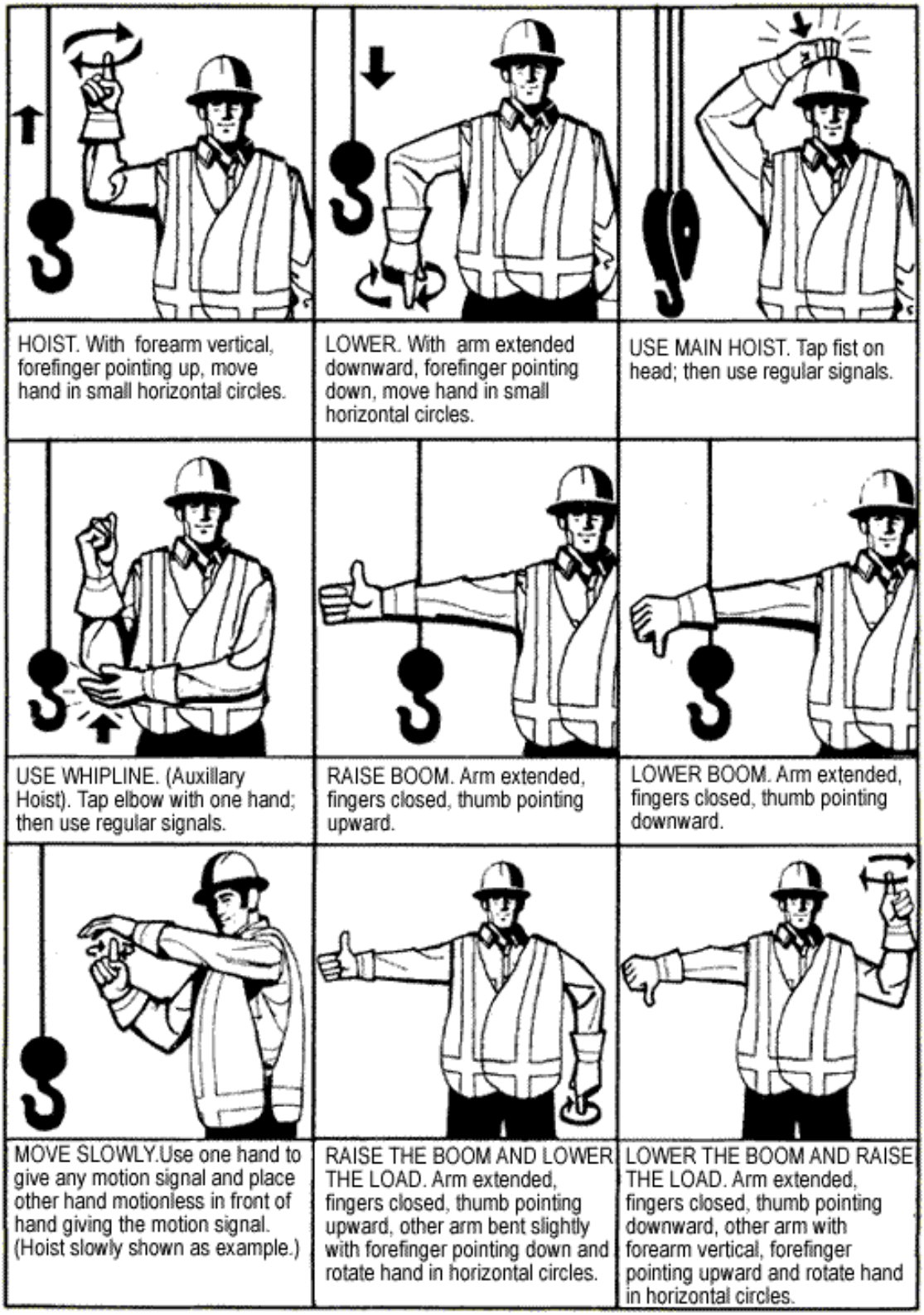


Figure 15-1 (continued):
Standard hand signals for controlling crane operations -- crawler, locomotive and truck cranes

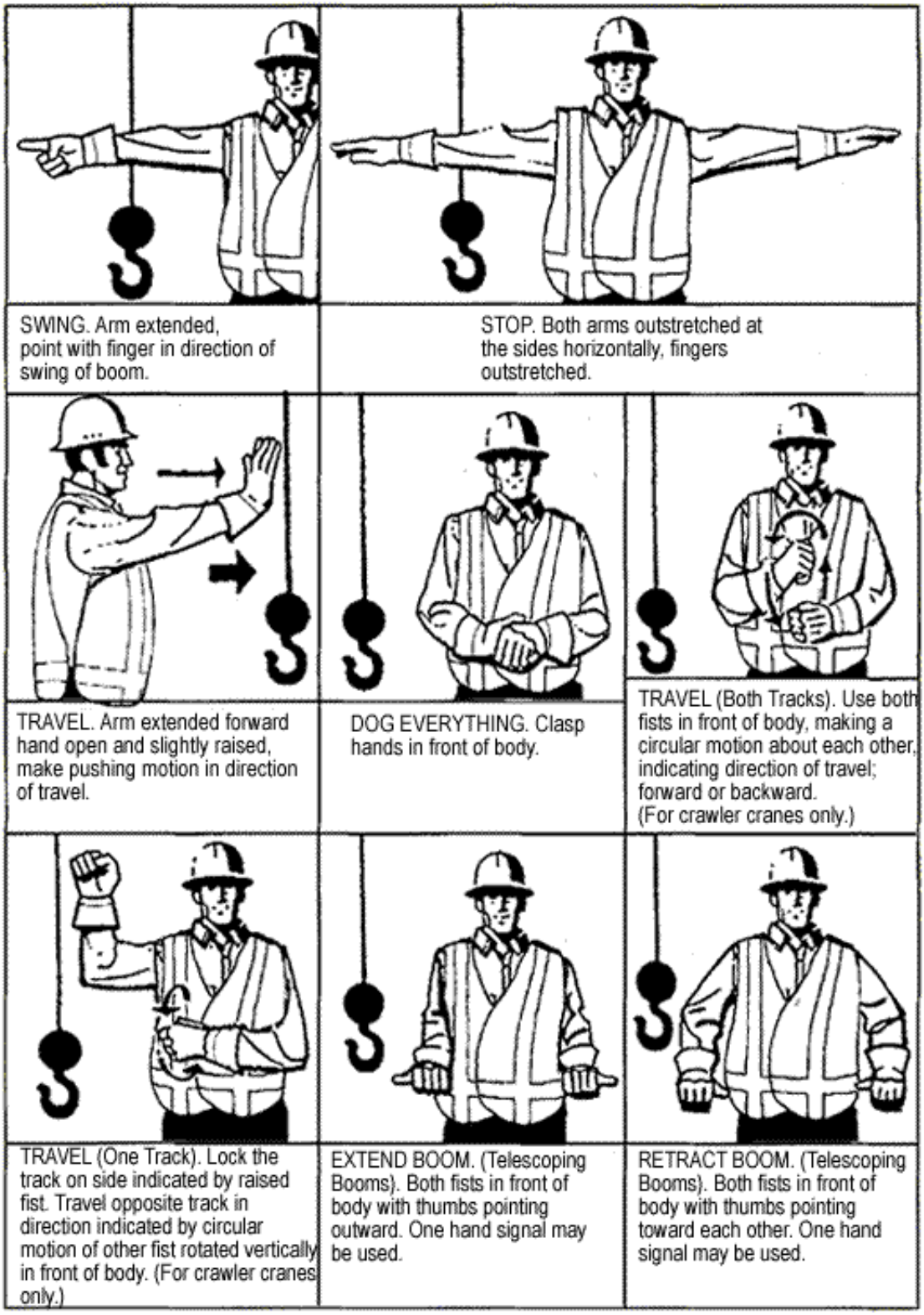


Figure 15-1 (continued):
Standard hand signals for controlling crane operations -- crawler, locomotive and truck cranes

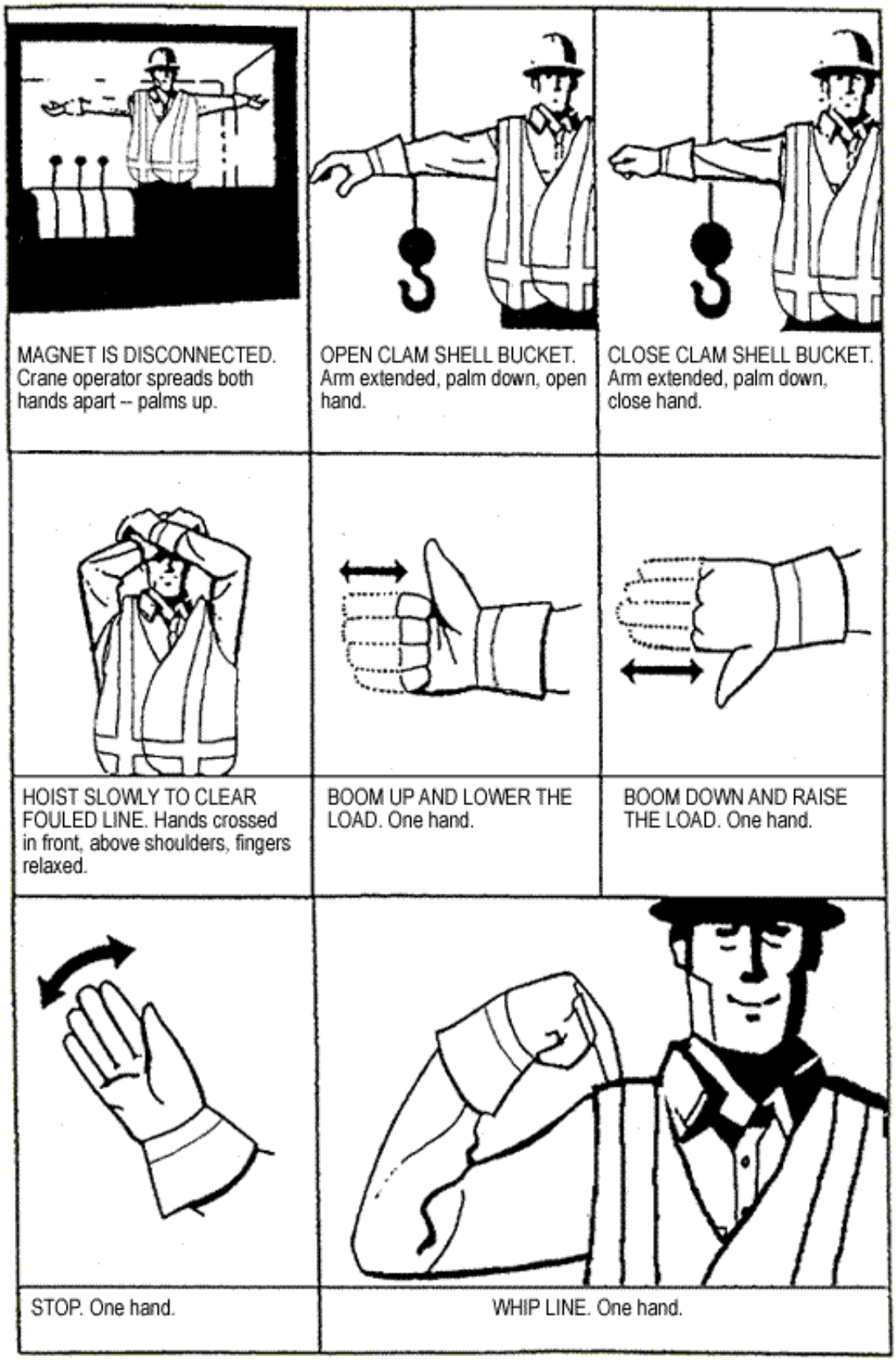
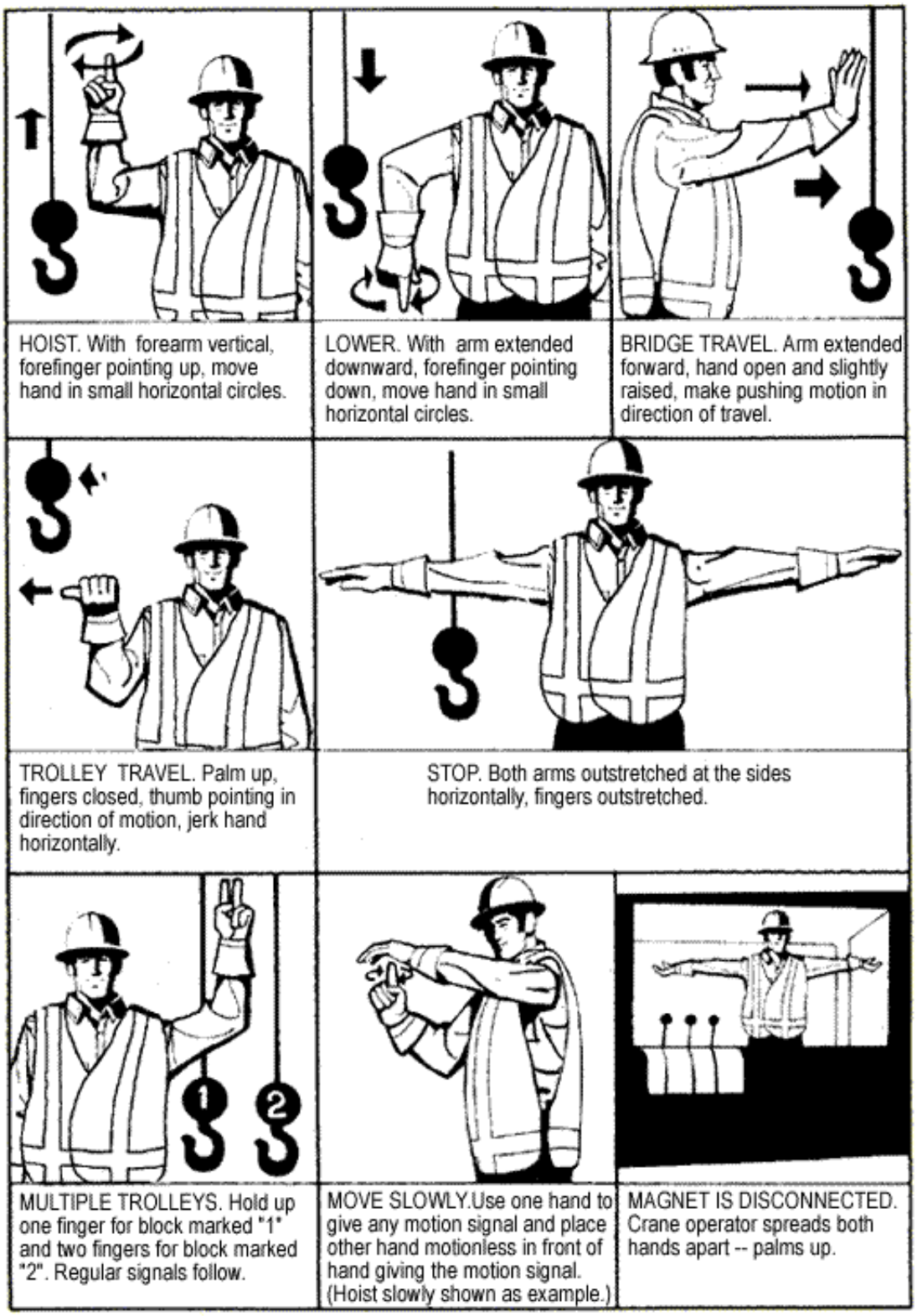


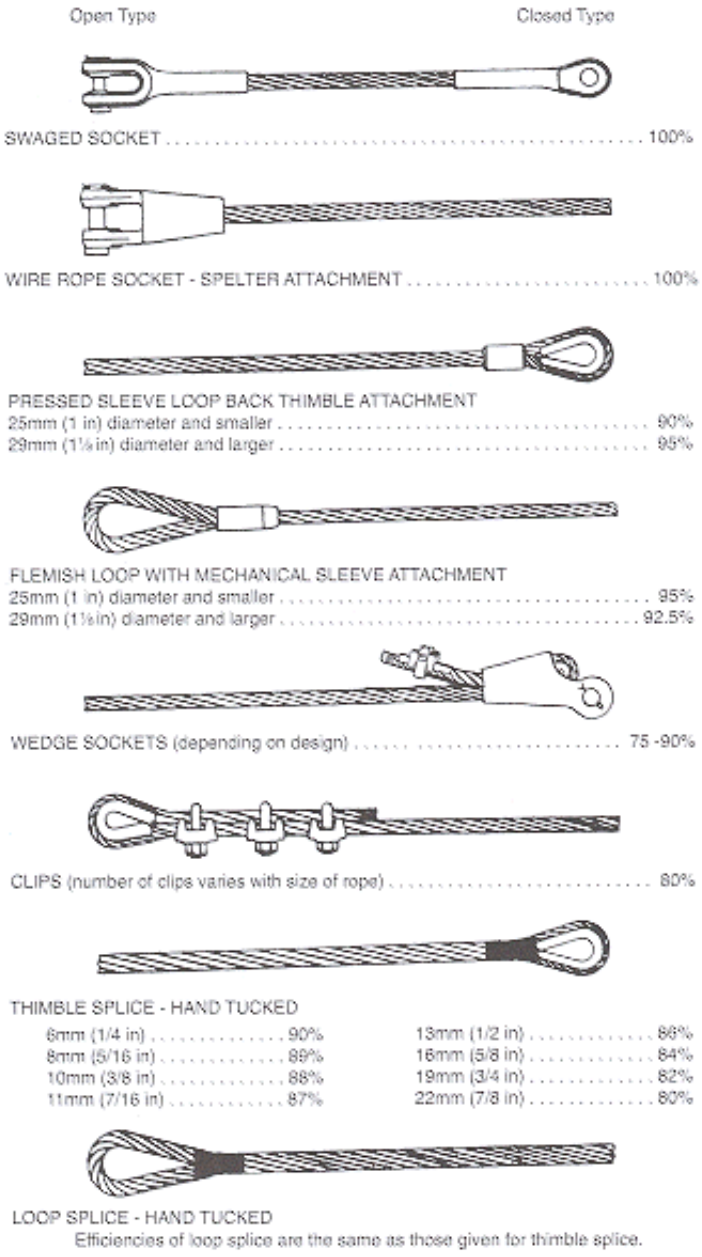
Figure 15-1 (continued):
Standard hand signals for controlling crane operations -- overhead and gantry cranes



15.21 Termination efficiencies

The working load limit must be reduced in accordance with the efficiency rating for the type of termination specified in Figure 15-2, unless otherwise permitted by the manufacturer.

Figure 15-2: Termination efficiencies



15.22 Wire rope clips

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

(2) If the manufacturer's specifications for installing and using wire rope clips cannot be determined, the number of clips and the installation torque must be as shown in Table 15-2.

(3) The U-bolt part of a wire rope clip must be installed so that it bears on the unloaded end of the wire rope.

(4) Malleable cast iron wire rope clips must not be used for hoisting or other critical applications unless approved by the manufacturer for that purpose.

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

(1) A turnback eye splice made using wire rope clips must use the number of clips

(a) specified by the manufacturer for each turnback eye termination, or

(b) if not specified by the manufacturer, specified in Table 15-2.

(2) A lap splice made using wire rope clips must use double the number of clips

(a) specified by the manufacturer for a turnback eye termination, or

(b) if not specified by the manufacturer, specified in Table 15-2.

Table 15-2: Installation and use of wire rope clips

Diameter of rope		**Number of clips**	**Spacing between clips (centre to centre)**		**Torque**	
millimetres	inches		**millimetres**	inches	**newton metres**	foot pounds
6	1/4	**2**	**38**	1 1/2	**20**	15
8	5/16	**2**	**51**	2	**41**	30
10	3/8	**2**	**57**	2 1/4	**61**	45
11	7/16	**2**	**64**	2 1/2	**88**	65
13	1/2	**3**	**76**	3	**88**	65
16	5/8	**3**	**102**	4	**129**	95
19	3/4	**4**	**114**	4 1/2	**176**	130
22	7/8	**4**	**133**	5 1/4	**305**	225
25	1	**4**	**152**	6	**305**	225
29	1 1/8	**5**	**178**	7	**305**	225
32	1 1/4	**5**	**203**	8	**488**	360
38	1 1/2	**6**	**229**	9	**488**	360
44	1 3/4	**7**	**267**	10 1/2	**630**	465
51	2	**8**	**305**	12	**881**	650
54	2 1/8	**8**	**330**	13	**881**	650
57	2 1/4	**8**	**356**	14	**881**	650

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

15.24 Restriction on fold back eyes

(1) A wire rope termination using a swaged fold back eye must be identified with a serial number or

other unique identification code, proof tested before being placed in service, and a record of the proof test kept available for the service life of the termination.

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

(3) A swaged fold back eye termination must be identified with the WLL as required by section 15.42.

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

15.25 Wire rope rejection criteria

Wire rope must be permanently removed from service if

(a) in running wire ropes, there are 6 or more randomly distributed wires broken in one rope lay or 3 or more wires are broken in one strand in one lay,

(b) in stationary wire ropes, such as guylines, there are 3 or more broken wires in one lay in sections between end connections, or more than one broken wire within one lay of an end connection,

(c) wear, or the effects of corrosion, exceed 1/3 of the original diameter of outside individual wires,

(d) there is evidence of kinking, bird-caging or any other damage resulting in distortion of the rope structure,

(e) there is evidence of heat or arc damage, or

(f) there are reductions of normal rope diameter, from any cause, in excess of

(i) 0.4 mm (1/64 in) for diameters up to and including 8 mm (5/16 in),

(ii) 1 mm (3/64 in) for diameters greater than 8 mm (5/16 in) up to and including 19 mm (3/4 in),

(iii) 2 mm (1/16 in) for diameters greater than 19 mm (3/4 in) up to and including 29 mm (1 1/8 in), or

(iv) 3 mm (3/32 in) for diameters greater than 29 mm (1 1/8 in).

15.26 Nonrotating wire rope

Wire rope with nonrotating construction must be removed from service if

(a) the rejection criteria in section 15.25 are met,

(b) there are 2 randomly distributed broken wires in 6 rope diameters, or

(c) there are 4 randomly distributed broken wires in 30 rope diameters.

15.27 Contact with electric arc

A rigging component or a wire rope that has been contacted by an electric arc must be removed from service until certified safe for continued use by a professional engineer.

15.28 Welding

(1) Rigging and fittings which have been repaired by welding must not be placed in service until certified safe for continued use by a professional engineer.

(2) Alloy steel chain must not be welded or annealed.

15.29 Hook rejection criteria

A worn or damaged hook must be permanently removed from service if

(a) the throat opening, measured at the narrowest point, has increased by more than 15% of the original opening,

(b) the hook has twisted more than 10° from the original plane of the hook,

(c) the hook has lost 10% or more of its cross-sectional area,

(d) the hook is cracked or otherwise defective, or

(e) wear or damage exceeds any criteria specified by the manufacturer.

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15.30 Standards

Unless otherwise required by this Regulation, wire rope, alloy steel chain, metal mesh, synthetic fibre rope, synthetic roundslings and synthetic fibre web slings must meet the requirements of *ASME B30.9-2006 Slings*.

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

15.31 Inspection before use

Slings and attachments must be visually inspected before use on each shift, and defective equipment must be immediately removed from service.

15.32 Makeshift fitting prohibition

Makeshift couplers, shorteners, hooks or other load bearing attachments for slings, including those made

from concrete reinforcing steel, must not be used unless the working load limit has been determined and certified by a professional engineer.

15.33 WLL of slings

(1) The determination of the working load limit of a sling assembly must ensure that the WLL of any individual component of the assembly is not exceeded.

(2) The WLL of a sling with more than 3 legs is limited to the WLL of any 3 legs of the sling.

(3) The load carried by any single leg of a bridle sling must not be greater than the WLL of the leg.

15.34 Sling angles

If a sling is used to lift at any angle from the vertical

(a) the design factors required by this Part must be maintained, and

(b) a qualified person or the manufacturer must determine the required reduction of the WLL of the sling, or it must be reduced according to Table 15-3.

Table 15-3: WLL reductions for slings at an angle

Angle between the sling leg and vertical	Reduce WLL to
up to 30°	90%
over 30° up to 45°	70%
over 45° up to 60°	50%
over 60°	not permitted unless part of an engineered lift

15.35 Adverse conditions

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

* See section 4.3 of the OHS Regulation.

15.36 Proof-testing slings

Before being placed in service any new, repaired or altered sling having welded couplers or other welded load bearing attachments must be proof tested by the manufacturer, or the manufacturer's representative or an agency acceptable to the Board in the manner specified by the manufacturer.

15.37 Storage

A sling must be stored to prevent damage when not in use.

15.38 Knots

A sling with a knot must not be used.

15.39 Sharp edges

When a sling is applied to a sharp edge of a load, the edge or the sling must be protected to prevent damage to the sling.

15.40 Slinging loads

(1) A sling must be selected and used to prevent slipping or overstressing the sling or the load.

(2) A load consisting of 2 or more pieces of material over 3 m (10 ft) long must be slung using a 2 legged sling arrangement positioned to keep the load horizontal during the lift, and each sling must be choked around the load with a double wrap.

15.41 Multiple piece lifts

For a multiple piece lift

(a) each member of the lift that is being delivered to a different spot must be independently slung back to the main load hook or master link using graduated length slings,

(b) a lifted member must not support another lifted member, and

(c) a crane with power controlled lowering must be used.

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Wire Rope Slings

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15.42 Sling identification

A wire rope sling with a swaged or poured socket or a pressed fitting must be permanently identified with

(a) its working load limit,

(b) the angle upon which the WLL is based, and

(c) the name or mark of the sling manufacturer.

15.43 Rejection criteria

(1) A wire rope sling must be permanently removed from service when the applicable rejection criteria of section 15.25 are found.

(2) A sling with damaged end fittings must not be used.

15.44 Prohibited slings

Wire rope of nonrotating type construction or of Lang's lay type construction must not be used in a sling.

15.45 Temperature restrictions

(1) A wire core rope sling must not be exposed to or used at a temperature above 205°C (400°F) unless otherwise specified by the manufacturer.

(2) A fibre core wire rope sling must not be exposed to or used at a temperature above 100°C (212°F) unless otherwise specified by the manufacturer.

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Alloy Steel Chain Slings

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15.46 Sling identification

An alloy steel chain sling must be permanently identified with

(a) the size,

(b) the manufacturer's grade and the WLL,

(c) the length and number of legs, and

(d) the name or mark of the sling manufacturer.

15.47 Chain for hoisting

(1) Chain used for hoisting must be approved by the chain manufacturer for hoisting.

(2) Proof coil and transport chain must not be used for hoisting.

15.48 Chain removal criteria

A chain sling must be permanently removed from service or repaired by a qualified person to the original manufacturer's specification or to the specifications of a professional engineer if the chain has defects such as stretch or deformation, cracks, nicks or gouges, corrosion pits or burned links.

15.49 Chain wear

(1) A chain sling must be permanently removed from service when the chain link wear is more than the maximum allowed by the manufacturer.

(2) If the manufacturer does not specify removal criteria for use in subsection (1), the chain must be permanently removed from service when the chain size at any point of the link is reduced to the values given in Table 15-4.

Table 15-4: Allowable chain wear

Chain size		**Minimum allowable chain size at any point of link**	
millimetres	inches	**millimetres**	inches
6.3	1/4	**5.9**	15/64
10	3/8	**8**	19/64
13	1/2	**10**	25/64
16	5/8	**12**	31/64
19	3/4	**15**	19/32
22	7/8	**18**	45/64
25	1	**21**	13/16
29	1 1/8	**23**	29/32
32	1 1/4	**25**	1
35	1 3/8	**28**	1 3/32
38	1 1/2	**30**	1 3/16
44	1 3/4	**36**	1 13/32

15.50 Periodic inspection

A chain sling must be thoroughly inspected at least once each year and a record of the inspection must be kept.

15.51 Temperature restriction

A chain sling must not be exposed to a temperature above 260°C (500°F) unless otherwise permitted by the manufacturer.

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Synthetic Web Slings

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15.52 Sling identification

Synthetic fibre web slings must be permanently identified with the

(a) manufacturer's name or mark,

(b) manufacturer's code or stock number,

(c) working load limits for the types of hitches permitted, and

(d) type of synthetic web material.

15.53 Temperature restriction

Synthetic fibre web slings must not be exposed to a temperature above 82°C (180°F) unless otherwise permitted by the manufacturer.

15.54 Synthetic web sling rejection criteria

A synthetic fibre web sling must be removed from service when any of the following circumstances occurs:

(a) the length of an edge cut exceeds the web thickness;

(b) the penetration of abrasion exceeds 15% of the webbing thickness taken as a proportion of all plies;

(c) abrasion occurs on both sides of the webbing and the sum of the abrasion on both sides exceeds 15% of the webbing thickness taken as a proportion of all plies;

(d) warp thread damage up to 50% of the sling thickness extends to within 1/4 of the sling width of the edge or exceeds 1/4 the width of the sling;

(e) warp thread damage to the full depth of the sling thickness extends to within 1/4 of the sling width of the edge or the width of damage exceeds 1/8 the width of the sling;

(f) weft thread damage allows warp thread separation exceeding 1/4 the width of the sling and extends in length more than twice the sling width;

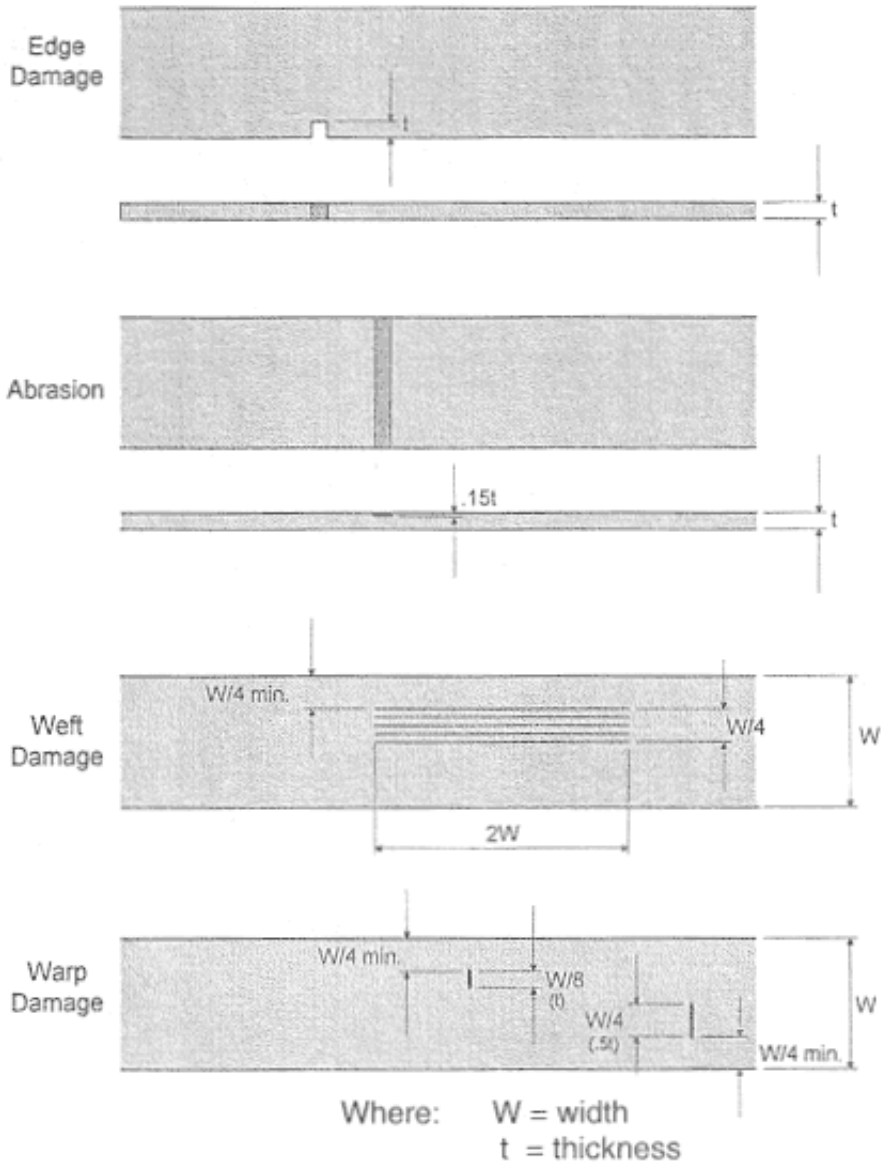
(g) any part of the sling is melted or charred, or is damaged by acid or caustic;

(h) stitches in load bearing splices are broken or worn;

(i) end fittings are excessively pitted or corroded, cracked, distorted or broken;

(j) a combination of the above types of damage of approximately equal total effect are present.

Figure 15-3: Examples of synthetic web sling rejection criteria



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Metal Mesh Slings

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15.55 Sling identification

A metal mesh sling must be permanently identified with

(a) the manufacturer's name or mark, and

(b) the WLL for vertical basket hitch and choker hitch configurations.

A metal mesh sling must be removed from service if any of the following damage is visible:

(a) a broken weld or a broken brazed joint along the sling edge;

(b) a broken wire in any part of the mesh;

(c) reduction in wire diameter of 25% due to abrasion or 15% due to corrosion;

(d) lack of flexibility due to distortion of the mesh;

(e) distortion of the choker fitting so that the depth of the slot is increased by more than 10%;

(f) distortion of either end fitting so that the width of the eye opening is decreased by more than 10%;

(g) a 15% reduction of the original cross-sectional area of metal at any point around the hook opening or end fitting;

(h) visible distortion of either end fitting;

(i) a cracked end fitting.

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Below-the-Hook Lifting Devices

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15.57 Standards

Spreader bars and other specialized below-the-hook lifting devices must be constructed, inspected, installed, tested, maintained and operated according to the requirements of *ASME B30.20-1993, Below-the-Hook Lifting Devices*.

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

* See also section 4.4 of the OHS Regulation.

15.58 WLL

Spreader bars and other specialized below-the-hook lifting devices must have their working load limit certified by a professional engineer or established by the lifting device manufacturer.

15.59 Identification

A nameplate or other permanent marking must be on a spreader bar or specialized below-the-hook lifting device and display the

(a) manufacturer's name and address,

(b) serial number,

(c) weight of the device, if more than 45 kg (100 lbs), and

(d) working load limit.

15.60 Part of lifted load

A spreader bar and any other specialized below-the-hook lifting device must be considered part of the lifted load.

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Part 16 Mobile Equipment

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Mobile Equipment Definitions

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16.1 Definitions

In this Part

"all-terrain cycle" means a motorized off-highway vehicle designed to travel on 3 low pressure tires, with a seat designed to be straddled by the operator and handlebars for steering;

"all-terrain vehicle" or "ATV" means a motorized off-highway vehicle, designed to travel on 4 or more low pressure tires with or without tracks added, with a seat designed to be straddled by the operator and handlebars for steering;

"mobile equipment" means a wheeled or tracked vehicle which is engine or motor powered, together with attached or towed equipment, but not a vehicle operated on fixed rails or tracks;

"no significant hazard of rollover" means an area in which there are no grades exceeding 10%, no operating areas with open edges, no open ramps, loading docks, ditches or other similar hazards which might cause a rollover;

"specific location" means a yard, plant or other clearly defined and limited area in which mobile equipment is operated, but does not include an entire municipality, district, transient forestry operation or construction site.

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16.2 Application

This Part applies to mobile equipment used by or around workers.

Note: Mobile equipment required to meet the requirements of the *Motor Vehicle Act* or the *Industrial Transportation Act* is subject to this Regulation for matters not specifically governed by those Acts and the regulations made under them.

16.3 Operation and maintenance

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

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

(3) Maintenance records for any service, repair or modification which affects the safe performance of the equipment must be maintained and be reasonably available to the operator and maintenance personnel during work hours.

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

(5) Servicing, maintenance and repair of mobile equipment must not be done when the equipment is operating, unless continued operation is essential to the process and a safe means is provided.

(6) Mobile equipment used off maintained roads must be appropriate and safe for the intended use considering factors such as the nature of the travel surface, the slope of the travel surface, and the activities to be undertaken.

(7) In addition to complying with the applicable requirements in this Part, a variable reach rough terrain forklift truck, as defined in section 2 of the standard adopted by reference under section 16.7 (e), must meet and be used in accordance with the requirements of sections 14.5, 14.7, 14.8, 14.12, 14.13, 14.15, 14.39, 14.43 and 14.69.

(8) A record of inspections and maintenance meeting the requirements of section 4.9 must be kept by the operator of a variable reach rough terrain forklift truck, as defined in section 2 of the standard adopted by reference under section 16.7 (e), and any other persons inspecting and maintaining that truck.

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

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]

16.4 Competency of operators

(1) A person must not operate mobile equipment unless the person

(a) has received adequate instruction in the safe use of the equipment,

(b) has demonstrated to a qualified supervisor or instructor competency in operating the equipment,

(c) if operating equipment with air brakes, has a valid air brake certificate or a driver's license with an air brake endorsement, or evidence of successful completion of a course of instruction on air brake systems by an organization acceptable to the Board, and

(d) is familiar with the operating instructions for the equipment.

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

* See section 4.10 of the OHS Regulation.

(2) Subsection (1)(a) and (c) does not apply if a trainee operates the equipment under the supervision of a qualified instructor, or a supervisor.

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

16.5 Operator's responsibility

The operator of mobile equipment must operate the equipment safely, maintain full control of the equipment, and comply with the laws governing the operation of the equipment.

16.6 Supervisor's responsibility

A supervisor must not knowingly operate or permit a worker to operate mobile equipment which is, or could create, an undue hazard to the health or safety of any person, or is in violation of this Regulation.

16.7 Standards

The design, fabrication, use, inspection and maintenance of mobile equipment must meet the requirements of the following applicable standard:

(a) Articulating Boom Cranes: *ANSI Standard ASME B30.22-2005, American National Standard for Articulating Boom Cranes;*

(b) Four Wheel All-Terrain Vehicles: *ANSI Standard SVIA-1-1990, American National Standard for Four Wheel All-Terrain Vehicles - Equipment, Configuration, and Performance Requirements;*

(c) Mobile and Locomotive Cranes: *CSA Standard Z150-1998, Safety Code for Mobile Cranes*, or *ANSI Standard ASME B30.5-2004, Mobile and Locomotive Cranes;*

(d) Powered Industrial Trucks (low lift and high lift): *ANSI Standard ANSI/ITSDF B56.1-2009, Safety Standard for Low Lift and High Lift Trucks;*

(e) Rough Terrain Forklifts: *ANSI Standard ANSI/ITSDF B56.6-2011, Safety Standard for Rough Terrain Forklift Trucks;*

(f) Side Boom Tractors: *ANSI Standard ASME B30.14-2004, Side Boom Tractors;*

(g) Vehicles with Mounted Aerial Devices (except fire-fighting equipment): *CSA Standard CAN/CSA-C225-10 Vehicle-mounted aerial devices* or *ANSI/SIA A92.2-2009 Vehicle-mounted elevating and rotating aerial devices;*

(h) Vehicles with Mounted Aerial Devices (fire fighting equipment): *NFPA 1904, Aerial Ladder and Elevating Platform Fire Apparatus, 1991 Edition;*

(i) Safety and hazard warnings: *ISO Standard 9244:1995 Earth-moving machinery - safety signs and hazard pictorials - General principles;*

(j) Lift Truck Operator training: *CSA Standard B335-94, Industrial Lift Truck Operator Training*.

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

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]

16.8 Warning signal device - backup alarm

If an operator of mobile equipment cannot directly or by a mirror or other effective device see immediately behind the mobile equipment, the mobile equipment must not be used unless the mobile equipment has an audio warning device that

(a) provides a signal to people in the vicinity that, if practicable, is audible above the ambient noise level in the workplace where the equipment is being used, and

(b) is activated automatically when the equipment controls are positioned to move the equipment in reverse.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

16.8.1 Warning signal device - extended component

(1) If mobile equipment is used to collect, transport or compact waste material, recyclable material or both, the mobile equipment must have a visual or audio warning device that

(a) provides a signal to the operator of the mobile equipment when a lifting mechanism, top door cover, body, tilt frame or tailgate component of the mobile equipment is extended in a manner that

(i) is likely to contact an overhead obstruction when the mobile equipment is in use, or

(ii) creates a hazardous condition, and

(b) meets the requirements of subsection (2) or (3), whichever is applicable.

(2) If a visual warning device is provided under subsection (1), the visual warning signal from the device must display within the operator's field of vision when the operator is using the mobile equipment.

(3) If an audio warning device is provided under subsection (1), the audio warning signal from the device must make a distinct sound that is audible to the operator above the ambient noise level when the operator is using the mobile equipment.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

16.9 Lights

(1) Mobile equipment used during the period from 1/2 hour after sunset to 1/2 hour before sunrise, or when persons or vehicles are not clearly discernible at a distance of 150 m (500 ft), must have and use lights to adequately illuminate

(a) the direction of travel,

(b) the working area about the mobile equipment, and

(c) the cab instruments.

(2) A headlight and backing light required by subsection (1)(a) must meet the requirements of *Society of Automotive Engineers (SAE) J1029 MAR86, Lighting and Marking of Construction and Industrial Machinery*.

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

16.10 Rear view mirrors

(1) Mobile equipment must have a mirror or mirrors providing the operator with an undistorted reflected view to the rear of the mobile equipment or combination of mobile equipment, except as provided in subsections (1.1), (1.2) and (2).

(1.1) If necessary to improve rear vision, parabolic mirrors in combination with flat mirrors may be used.

(1.2) A parabolic mirror, flat mirror or both may be used on a lift truck.

(2) A rear view mirror is not required on mobile equipment if the conditions of use or equipment structure makes the use of mirrors impracticable.

[Enacted by B.C. Reg. 253/2001, effective January 28, 2002.]

16.11 Window standards

(1) Windows on mobile equipment must be made of safety glazing meeting the requirements of *ANSI Standard Z26.1-1990, American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways - Safety Code*.

(2) If the maximum travel speed of a machine is 40 km/h (25 mph) or less, tempered windscreen glazing meeting the requirements of *ANSI/SAE Z26.1-1990, American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways - Safety Code,* section 4, item 2 is permitted for use as the windshield on the front of the machine.

(3) If wipers are used on plastic glazing, the glazing surface must be hard coated.

(4) Each window on mobile equipment manufactured after February 1, 2002 or otherwise installed on mobile equipment after that date must be marked to identify the manufacturer, the standard to which the window conforms, and in the case of polycarbonate windows, the thickness and grade of material.

[Enacted by B.C. Reg. 253/2001, effective January 28, 2002.]

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

16.12 Maintenance

Windshields, side and rear windows, and rear-vision mirrors must be maintained to provide clear vision to the operator.

16.13 Braking requirements

(1) Mobile equipment must have braking systems meeting the requirements of the following applicable

standard:

(a) *Society of Automotive Engineers (SAE) Standard J1473 OCT90, Brake Performance - Rubber-Tired Earthmoving Machines;*

(b) *Society of Automotive Engineers (SAE) Standard J1026 APR90, Braking Performance - Crawler Tractors and Crawler Loaders;*

(c) *Society of Automotive Engineers (SAE) Standard J1178 ISO11169 DEC94, Machinery for Forestry - Wheeled Special Machines - Vocabulary, Performance Test Methods, and Criteria for Brake Systems;*

(d) *Society of Automotive Engineers (SAE) Standard J1472 JUN87, Braking Performance - Roller Compactors;*

(e) *ANSI Standard ASME B56.1-1993, Safety Standard for Low Lift and High Lift Trucks;*

(f) *ANSI Standard ANSI/ASME B56.6-1992, Safety Standard for Rough Terrain Forklift Trucks;*

(g) *SAE J/ISO 11512 MAR96, Machinery for Forestry - Tracked Special Machines - Performance Criteria for Brake Systems.*

(2) Mobile equipment manufactured before the publication of the standards listed in subsection (1) may remain in service using the brake system originally specified by the manufacturer unless, in the opinion of the Board, modification is necessary to ensure that the braking system is adequate.

(3) Mobile equipment used as an off-road transport vehicle on a slope greater than 20% must have a braking system meeting the performance requirements of *Society of Automotive Engineers (SAE) Standard J1178 ISO11169 DEC94, Machinery for Forestry - Wheeled Special Machines -Vocabulary, Performance Test Methods, and Criteria for Brake Systems*.

(4) Mobile equipment must have a parking system that does not use gas or fluid pressure to maintain its application and the parking system control must be located so that the operator, in the operator's seat, can activate it.

(5) If mobile equipment depends on engine power for stopping and power failure will result in loss of adequate capability to stop, supplementary means must be provided to enable the operator to bring the equipment to a controlled stop.

(6) If the Board is satisfied that it is not practicable to comply with subsections (1) to (5), the Board may exempt the mobile equipment from their application subject to conditions the Board specifies.

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

* See also section 4.4 of the OHS Regulation.

Note: Under subsection (5) the automatic and gradual application of spring brakes is an acceptable supplementary means if warning devices are installed to warn of low air pressure and allow the operator to bring the vehicle to a controlled stop.

16.14 Supplementary steering

(1) If wheeled mobile equipment depends on engine power for steering and power failure will result in loss of adequate directional control, a supplementary system must be provided to enable the operator to steer to a controlled stop.

(2) The supplementary steering system required by subsection (1) for equipment capable of a travel speed greater than 20 km/h (13 mph) must meet the requirements of *Society of Automotive Engineers (SAE) Standard J1511 ISO5010 FEB94, Steering For Off-Road, Rubber-Tired Machines*.

(3) A rubber tired skidder manufactured after January 1, 2000 must have a supplementary steering system meeting the requirements of subsection (2).

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

16.15 Steering wheel knobs

(1) A steering wheel knob is not permitted on mobile equipment if road wheel reaction forces to the steering wheel are hazardous to the operator.

(2) A steering wheel knob must be a low profile or mushroom type, and lie completely within the periphery of the steering wheel.

16.16 Safe starting

Mobile equipment must be protected against engine starter engagement when the engine is coupled to the wheels or tracks.

16.17 Escape from a cab

(1) Mobile equipment with a single cab entrance door, manufactured after January 1, 2000, must have an alternate means of escape that is clearly marked both inside and outside the cab and which

(a) is not located on the same surface as the cab entrance door,

(b) is usable regardless of the position of movable components or accessories of the machine,

(c) does not pose additional hazards to the operator,

(d) can be opened from both the inside and outside without the use of tools when the equipment is in use,

(e) requires a force of not more than 135 N (30 lbs) to open, and

(f) provides a clear opening of at least 65 cm (26 in) in diameter if circular, 60 cm (24 in) on each side if square, and 47 cm by 65 cm (19 in by 26 in) if rectangular, or the dimensions of which comply with *ISO Standard 2867-1994, Earth-Moving Machinery - Access Systems*.

(2) Mobile equipment with a single cab entrance door, manufactured before January 1, 2000, must meet the requirements for an alternate means of escape required at the date of manufacture, unless otherwise directed by the Board.

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

16.18 Controls

(1) Operating controls for mobile equipment must meet the requirements of a standard acceptable to the Board for the type of equipment.

(2) Operating controls must be identified to show the function they serve and be located and maintained to allow safe operation of the equipment.

(3) Repealed. [B.C. Reg. 381/2004, effective January 1, 2005.]

16.19 Load handling attachments

(1) Buckets, forks, booms, hoists and other load handling attachments must only be installed on mobile equipment as specified by the equipment manufacturer or when certified by a professional engineer for use on the equipment.

(2) The installation specified by the equipment manufacturer or certified by the professional engineer under subsection (1) for hoists or load handling attachments must

(a) include instructions for safe use of the equipment with the load handling attachment, and

(b) provide for the evaluation of the stability of the equipment, including the effect of load swing.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

16.20 Load ratings

(1) Mobile equipment designed and used for lifting, hoisting or similar operations must have a permanently affixed notation, legible and visible to the operator, stating the rated load of the equipment.

(2) A load chart must be displayed in the operator's cab if the rated load varies with the reach of the equipment.

(3) If the equipment is modified the employer must ensure that the rated load and load chart are changed as necessary to reflect the new load ratings.

(4) Mobile logging equipment is exempt from the requirements in subsections (1) to (3).

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16.21 Protective structures

(1) Operators of mobile equipment must be protected against falling, flying or intruding objects or

material by means of suitable cabs, screens, grills, shields, deflectors, guards or structures.

(2) The means of protection must meet the requirements of the following applicable standard:

(a) *WCB Standard — G601, Standard for Log Loader and Log Yarder Backstops;*

(b) *WCB Standard — G602, Standard for Log Loader and Log Yarder Raised Cabs;*

(c) *WCB Standard — G603, Standard for Log Loader and Log Yarder Window Guards;*

(d) *WCB Standard — G604, Standard for Light-Duty Screen Guards for Off-Highway Equipment;*

(e) *WCB Standard — G605, Standard for Mobile Equipment Half-Doors;*

(f) *WCB Standard — G607, Standard for Medium Duty Screen Guards — Front End Log Loader;*

(g) *WCB Standard — G608, Standard for Mobile Equipment Roof Structures — Heavy Duty;*

(h) *WCB Standard — G609, Standard for Mobile Equipment Roof Structures — Light Duty;*

(i) *Society of Automotive Engineers (SAE) Recommended Practice J231 JAN81, Minimum Performance Criteria for Falling Object Protective Structure (FOPS);*

(j) *Society of Automotive Engineers (SAE) Standard J1043 SEP87, Performance Criteria for Falling Object Protective Structure (FOPS) for Industrial Machines;*

(k) *ISO Standard 3449:1992, Earth-Moving Machinery — Falling-Object Protective Structures — Laboratory Tests and Performance Requirements;*

(l) *Society of Automotive Engineers (SAE) Recommended Practice J1084 APR80, Operator Protective Structure Performance Criteria for Certain Forestry Equipment;*

(m) *Society of Automotive Engineers (SAE) Recommended Practice J1356 FEB88, Performance Criteria for Falling Object Guards for Excavators.*

(3) A worker must not remain in the cab of a vehicle while loads are elevated over the cab unless the cab is protected by an adequate overhead guard.

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

* See also section 4.4 of the OHS Regulation.

Note: Information on the selection of guarding for mobile equipment used in various applications is provided in the WorkSafeBC publication *Standards for Operator Protective Structures (OPS)*.

16.22 Rollover protective structures

(1) The following types of mobile equipment, weighing 700 kg (1 500 lbs) or more, must have rollover protective structures (ROPS):

(a) crawler tractors, loaders and skidders;

(b) wheel tractors, dozers, loaders and skidders;

(c) motor graders;

(d) self-propelled wheel scrapers;

(e) compactors/rollers;

(f) self-propelled rock drills moved by an on-board operator;

(g) wheeled trenchers manufactured after January 1, 1999;

(h) pipe layers or side boom tractors manufactured after January 1, 2000.

(2) The Board may require a ROPS to be installed on any mobile equipment if the design of the equipment or circumstances of use indicate the need.

(3) Mobile equipment listed in subsection (1) may be used without a ROPS if

(a) the equipment operates in a specific location where there is no significant hazard of rollover, and

(b) the surface in the area of operation is maintained free of ground irregularities which might cause a rollover.

Note: Where circumstances render compliance with the requirement for ROPS impracticable, alternative proposals designed to provide equivalent protection to workers may be submitted to the Board for consideration.

16.23 ROPS standards

A ROPS must meet the requirements of one of the following applicable standards:

(a) *CSA Standard B352.0-95, Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines — Part 1: General Requirements*, and

(i) *CSA Standard B352.1-95, Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines — Part 2: Testing Requirements for ROPS on Agricultural Tractors*, or

(ii) *CSA Standard B352.2-95, Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines — Part 3: Testing Requirements for ROPS on Construction, Earthmoving, Forestry, Industrial, and Mining Machines*;

(b) *Society of Automotive Engineers (SAE) Standard J1040 MAY94, Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry, and Mining Machines;*

(c) *ISO Standard 3471: 1994, Earth-moving Machinery — Rollover Protective Structures — Laboratory Tests and Performance Requirements.*

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

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

* See section 4.4 of the OHS Regulation.

Note: Clause 6 of *CSA Standard B352-M80, Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial and Mining Machines* is a standard acceptable to the Board under section 4.4(2) for the design of a ROPS for a one-of-a-kind machine.

16.24 ROPS certification

(1) A ROPS must be certified by the ROPS manufacturer or a professional engineer as meeting a standard specified in section 16.23.

(2) Any addition, modification, welding or cutting on a ROPS must be done in accordance with the instructions of and be recertified by the ROPS manufacturer or a professional engineer.

16.25 ROPS identification

(1) The following information must be permanently marked upon a ROPS:

(a) the name and address of the manufacturer or the professional engineer who certified the ROPS;

(b) the model number or other effective means of identifying the machine for which the ROPS was designed;

(c) the serial number or other unique means of identifying the ROPS;

(d) the maximum weight of the machine for which the ROPS was designed;

(e) the standard to which the ROPS conforms.

(2) Modified ROPS must be permanently marked with the following information:

(a) an identification of the modifications effected;

(b) the date of recertification;

(c) the name and address of the recertifying engineer.

16.26 Effect of ROPS on visibility

ROPS and other structures required by this Part for the protection of the operator must be designed and installed to provide an adequate view for the operator to safely use the machine.

16.27 Shear hazards

Mobile equipment with moving parts close to the operator's compartment must be effectively guarded so that

(a) the controls inside the compartment cannot be operated from outside the compartment, unless there is no hazard, and

(b) no part of any person in the operating position inside the compartment can project into the hazard area created by the moving part.

16.28 Guarding moving parts

Exposed moving parts on mobile equipment which are a hazard to the operator or to other workers must be guarded according to a standard acceptable to the Board, and if a part must be exposed for proper function it must be guarded as much as is practicable consistent with the intended function of the component.

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16.29 Operator's seat

(1) A safely located and securely mounted seat must be provided for the operator of mobile equipment unless the equipment is designed to be controlled by an operator in the standing position.

(2) The operator's seat must be of a design that allows the operator to safely operate the equipment with due regard for the type and intended use of the equipment, reach distances to controls and duration of use.

(3) Seating for equipment operated on rough terrain must provide adequate lateral restraint.

16.30 Restricted access

Only authorized persons may be on mobile equipment while the equipment is in motion.

16.31 Rider restriction

(0.1) In this section:

"barricade" means a barricade referred to as a class 1A, class 1, class 2 or class 3 barricade in chapter 2 of the traffic control manual;

"buffer vehicle" means a vehicle referred to as a buffer vehicle in the section entitled "Buffer Vehicles" in chapter 2 of the traffic control manual;

"flashing arrow board" means a traffic sign referred to as a flashing arrow board in the section entitled "Flashing Arrow Boards (FABs)" in chapter 2 of the traffic control manual;

"flexible drum" means a traffic control device referred to as a flexible drum in the section entitled "Flexible Drums" in chapter 2 of the traffic control manual;

"multilane roadway" means a roadway that has 2 or more lanes in which traffic flows in the same direction, including climbing and passing lanes, whether or not there are also lanes in which traffic flows in the opposite direction;

"ROPS" means a rollover protective structure that meets the requirements of sections 16.23, 16.24, 16.25 and 16.26;

"traffic cone" means a traffic cone or tubular marker referred to in the section entitled "Traffic Cones and Tubular Markers" in chapter 2 of the traffic control manual;

"traffic control manual" means the *Traffic Control Manual for Work on Roadways* (revised and consolidated, 1999), published by the government.

(1) The operator of mobile equipment is the only worker permitted to ride the equipment unless the equipment is a worker transportation vehicle meeting the requirements of Part 17 (Transportation of Workers), or as contemplated by subsection (2), subsections (3.1) and (3.2) or subsection (4).

(2) A worker who must ride on mobile equipment to carry out a job task may ride non-ROPS equipped mobile equipment on

(a) an appropriate seat, or

(b) other safe facilities provided by the equipment manufacturer or designed by a professional engineer, which include

(i) a footboard or platform upon which the worker stands or sits, located to protect the worker from contact with roadside objects or other vehicles,

(ii) hand-holds, and

(iii) a safety belt, harness, guardrail or other effective means of restraint, except where the worker is a swamper riding on the back of a garbage truck during short pickup runs at speeds of less than 20 km/h.

(3) Rear mounted footboards or platforms must not be occupied if the mobile equipment is backing up.

(3.1) A worker who is occupying a rear mounted platform on non-ROPS equipped mobile equipment as part of a method of retrieving traffic cones from a closed lane of a multilane roadway is not prohibited under subsection (3) of this section or under section 18.3 from occupying the platform when the mobile equipment is backing up if all of the following conditions are met:

(a) the mobile equipment is backing up in the closed lane;

(b) the employer has

(i) identified the hazards to the workers at the workplace, and

(ii) taken measures

(a) to eliminate the hazards, or

(b) if it is not practicable to eliminate an identified hazard, to minimize the risk to workers from the hazard to the lowest level practicable;

(c) a written safe work procedure that

(i) relates to that method of retrieving traffic cones, and

(ii) includes a description of the measures referred to in paragraph (b)

has been established by the employer and is being followed;

(d) the mobile equipment is not exceeding a speed of 15 km per hour;

(e) the mobile equipment has the following operating devices:

(i) two or more 360 degree flashing yellow lights;

(ii) a flashing arrow board pointing toward the open lane adjacent to the closed lane;

(f) the mobile equipment has an audio warning device that

(i) makes a distinct sound that is audible, above the ambient noise level in the workplace, to both the driver of the mobile equipment and the worker, and

(ii) operates automatically and at all times while the mobile equipment is backing up;

(g) there is an effective 2-way voice communication system between the driver of the mobile equipment and the worker while the worker is on the platform;

(h) one of the following requirements is met:

(i) behind the rear of the mobile equipment, barricades are placed across the closed lane or flexible drums are placed in the centre of the closed lane, in accordance with the following:

(A) the barricade or flexible drum closest to the mobile equipment is at all times located not more than 250 m from the rear of the mobile equipment;

(B) the barricades or flexible drums are located along the length and to the end of the closed lane at intervals of not greater than 250 m;

(ii) directly behind and at a safe distance from the rear of the mobile equipment, in the closed lane, there is a buffer vehicle that meets the following requirements:

(A) the buffer vehicle is at all times located not more than 100 m from the rear of the mobile equipment;

(B) the buffer vehicle has two or more 360 degree flashing yellow lights and the lights are operating;

(C) the buffer vehicle has a flashing arrow board pointing toward the open lane adjacent to the closed lane and the flashing arrow board is operating;

(D) there is an effective 3-way voice communication system among the driver of the buffer vehicle, the driver of the mobile equipment and the worker while the worker is on the platform;

(i) the worker is riding on safe facilities that meet the requirements of subsection (2) (b);

(j) the maximum load capacity established for the platform by the manufacturer or by the professional

engineer who designed the platform is clearly marked on the platform and is not being exceeded.

(3.2) Unless otherwise provided in subsection (3.1), the equipment, arrangements and procedures referred to in that subsection must meet all applicable requirements in respect of equipment, arrangements and procedures that are set out for traffic control under Part 18.

(4) A worker other than the operator may only ride on mobile equipment with a ROPS for the purpose of training or maintenance, and only then if the equipment is operated in an area with no significant hazard of rollover.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

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16.32 Provision

(1) Mobile equipment with ROPS and side boom tractors must have seat belts which meet the requirements of *Society of Automotive Engineers (SAE) Standard J386 JUN93, Operator Restraint System for Off-Road Work Machines*.

(2) Seat belts must be maintained in good condition.

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

16.33 Use

(1) If mobile equipment has seat belts required by any law in British Columbia, the operator and passengers must use the belts whenever the equipment is in motion, or engaged in an operation which could cause the equipment to become unstable.

(2) The use of a seat belt is not required for

(a) a road grader operation that requires the operator to stand, in which case, an enclosed cab with closed cab doors or other effective restraining devices must be used,

(b) a side boom tractor without a ROPS, or

(c) ROPS equipped mobile equipment if the mobile equipment operates in a specific location where there is no significant hazard of rollover, and the surface in the area of operation is maintained free of ground irregularities which might cause a rollover.

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Operating Requirements

16.34 Start of shift inspection

(1) The operator must inspect the equipment before the start of operation on the shift and thereafter as required to ensure the safe operating condition of the equipment.

(2) The operator must report defects and conditions affecting the safe operation of the equipment to the supervisor or employer.

(3) Any repair or adjustment necessary for the safe operation of the equipment must be made before the equipment is used.

16.35 Securing tools and equipment

The operator must maintain the cab, floor and deck of mobile equipment free of material, tools or other objects which could create a tripping hazard, interfere with the operation of controls, or be a hazard to the operator or other occupants in the event of an accident.

16.36 Unattended equipment

(1) The operator of mobile equipment must not leave the controls unattended unless the equipment has been secured against inadvertent movement such as by setting the parking brake, placing the transmission in the manufacturer's specified park position, and by chocking wheels where necessary.

(2) Any grapples or tongs on mobile equipment must be landed in a safe position before the equipment controls are left unattended.

16.37 Securing elevated loads

(1) An operator must not leave unattended any elevated load, part, extension or machine, unless it has been immobilized and secured against inadvertent movement.

(2) If a worker is required to work beneath an elevated part of mobile equipment, the elevated part must be securely blocked.

(3) Hydraulic or pneumatic jacks must not be used for blocking unless fitted with devices to prevent their collapse in the event of loss of hydraulic or pneumatic pressure.

(4) A dump truck with a chassis manufactured after January 1, 1999 must have a permanently affixed mechanical device capable of supporting the empty dump box in the raised position.

16.38 Assistance on grades

(1) If the grade or condition of the travel surface may result in a piece of mobile equipment having insufficient braking capability to maintain adequate control the equipment must be snubbed by a cable, or a suitable vehicle must be used to ensure safety when negotiating the grade.

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

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

16.39 Swinging equipment

If a hazard is created by the swinging movement of the load, cab, counterweight or any other part of the mobile equipment a worker must not be within range of the swinging load or equipment, and the operator must not move the equipment when any worker is so exposed.

16.40 Clearance

Equipment must be positioned so that no swinging portion of the equipment can come within 60 cm (2 ft) of any obstruction in any area accessible to workers, or entry to such areas must be prevented by barriers or other effective means.

16.41 Boarding/leaving

A person must not board or leave any mobile equipment while it is in motion, except in an emergency.

16.42 Obstructed view

If a mobile equipment operator's view of the work area is obstructed the operator must not move the equipment until precautions have been taken to protect the operator and any other worker from injury, including

(a) immediately before the movement, the inspection by the operator on foot of the area into which the equipment will be moved,

(b) direction by a signaller stationed in a safe position in continuous view of the operator and having an unobstructed view of the area into which the equipment will move, or

(c) direction by a traffic control or warning system.

16.43 Pedestrian and equipment traffic

(1) Where practicable, designated walkways must be used to separate pedestrian traffic from areas of operation of mobile equipment.

(2) If it is impracticable to provide designated walkways, adequate safe work procedures to minimize the possibility of collision must be used in hazardous work areas, including

(a) the use of a traffic control system,

(b) enforcement of speed limits for mobile equipment,

(c) a requirement for the pedestrian and the mobile equipment operator to acknowledge each other's presence before the pedestrian proceeds through the hazardous area, or

(d) other effective means.

(3) In areas where lift truck use is separated from pedestrian traffic, a lift truck may travel forward with an elevated load if such operation will improve the operator's view of the path of travel, provided that operating conditions are maintained to ensure vehicle stability and the specifications of the equipment manufacturer are not compromised.

16.44 Securing loads

(1) When material or equipment is being transported it must be loaded or secured to prevent movement of the load which could create a hazard to workers.

(2) To protect the crew of a vehicle transporting a load which might shift on rapid deceleration of the vehicle, a means of load restraint must be provided which

(a) will prevent significant load shift relative to the carrier under emergency stopping conditions, and

(b) meets a standard acceptable to the Board.

(3) Subsection (2) does not apply to logging trucks operating in compliance with the requirements of Part 26 (Forestry Operations and Similar Activities).

16.45 Restraint for cylindrical objects

(1) Cylindrical objects transported on their sides must be effectively restrained against inadvertent movement during loading and unloading.

(2) If perimeter pins are used as part of the restraint system for cylindrical objects the pins must extend above the top of the uppermost lay adjacent to the pin by the diameter of the largest cylindrical object stacked above the uppermost lay adjacent to the pin, and have a minimum height of 46 cm (18 in).

(3) If cylindrical objects are individually blocked or otherwise effectively restrained by specialized dunnage, perimeter pins specified by subjection (2) are not required.

16.46 Lift truck loads

(1) A unitized load being transported on a lift truck must not project a distance greater than half its height above the fork carriage, back rest or back rest extension of the lift truck.

(2) No part of a load comprised of loose objects may project above the fork carriage, back rest or back extension of a lift truck.

(3) A load which could shift during transportation must be restrained if such shifting would result in the load or the lift truck becoming unstable.

(4) Subsections (1) to (3) do not apply if the load is assembled and handled in such a way that there is no possibility of any part of the load falling off.

Tire Servicing

16.47 Training

(1) The employer must establish and implement safe work procedures for servicing mobile equipment tires, rims and wheels, including safe procedures for

(a) inspecting tire, rim and wheel components,

(b) mounting a tire to the rim and wheel, and inflating a tire,

(c) installing and removing tire assemblies from mobile equipment, and

(d) demounting tires from the rim and wheel assemblies.

(2) Workers assigned to work on tires, rims and wheels must be trained in and follow the safe work procedures established under subsection (1).

16.48 Equipment and procedures

(1) A tire must be deflated before demounting, and deflation must be done in an area where ignition sources are controlled or removed.

(2) Each tire, rim and wheel part must be cleaned and inspected for damage before mounting, and cracked, broken, bent or otherwise damaged parts replaced.

(3) A tire must be inflated using a remote chuck with a sufficient length of hose and an inline, hand operated valve with a gauge so the worker is outside the likely trajectory should wheel components separate during inflation.

(4) A tire mounted on a multipiece rim wheel must be placed in a cage or other restraining device when it is being inflated.

(5) If a bead expander is used to seat the beads of a tire, it must be removed before the tire is inflated to more than 34.5 kPa (5 psi).

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

(7) Welding or heating on assembled rim or wheel parts is not permitted, except that limited heating to facilitate removal of a wheel from a hub is acceptable after the tire has been deflated by removing the valve core.

(8) A tire on a multipiece rim wheel must be deflated to atmospheric pressure by removing the valve core or by other effective means before demounting, and in the case of a dual wheel arrangement, both tires

must be deflated to atmospheric pressure before loosening any wheel nuts.

(9) Multipiece rim and wheel components must not be interchanged except as permitted by rim/wheel charts from the appropriate rim/wheel manufacturer.

(10) Multipiece rim wheels which have been used at less than 80% of the recommended inflation pressure for that application must be deflated, disassembled and inspected before reinflation.

(11) Procedures other than those specified in subsections (1) to (10) that provide equivalent or better safety may be used if acceptable to the Board.

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

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Note: The following requirements for all-terrain vehicles are in addition to the other requirements for mobile equipment in this Part which also apply to ATVs. Any vehicle used off maintained roads, including an ATV, is required by section 16.3(6) to be appropriate and safe for the intended use.

16.49 Prohibited use

An all-terrain cycle must not be used in any occupational, industrial, or commercial workplace.

16.50 Modifications

A modification to an ATV which may affect its structural integrity or stability must be certified by a professional engineer.

16.51 Operator's manual

(1) The operator's manual for an ATV must be kept in a secure place with the vehicle or at another location readily accessible to the operator.

(2) The operator must use an ATV in accordance with the instructions in the operator's manual.

16.52 Use on sloping ground

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

(2) If the manufacturer has not set limits for operation of the ATV on sloping ground, 5% is the maximum allowable slope unless the employer has developed and implemented written safe work procedures appropriate for any steeper slope on which the equipment is to be used.

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

16.53 Operator training

(1) The employer must ensure that each ATV operator is properly trained in the safe operation of the vehicle.

(2) The training program for an ATV operator must cover

(a) the operator's pretrip inspection,

(b) use of personal protective apparel,

(c) operating skills according to the ATV manufacturer's instructions,

(d) basic mechanical requirements, and

(e) loading and unloading the vehicle, if this is a job requirement.

16.54 Personal protective equipment

(1) An ATV operator and any passenger on an ATV must wear eye protection as required by Part 8 (Personal Protective Clothing and Equipment), and hearing protection meeting the requirements of Part 7 (Noise, Vibration, Radiation and Temperature).

(2) An ATV operator and any passenger on an ATV must wear

(a) clothing suitable for the environmental conditions, and

(b) when necessary to protect against the hazards presented at the worksite, suitable gloves and clothing which covers the ankles and legs and the arms to the wrists.

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

16.55 Loading and unloading

(1) Loading and unloading of an ATV onto or off a carrier vehicle must be done in a safe manner.

(2) If ramps are used when loading or unloading an ATV, they must be placed at a suitable angle, be sufficiently wide and have a surface finish which provides an adequate grip for the ATV's tires.

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Part 17 Transportation of Workers

Part 17 Contents

GENERAL REQUIREMENTS

WORKER TRANSPORTATION VEHICLES NOT DESIGNED FOR USE ON HIGHWAYS

MARINE CRAFT

AIRCRAFT

General Requirements

17.01 Definitions

In this Part:
"gross vehicle weight rating (GVWR)" means the manufacturer's maximum recommended weight for a vehicle, including the weight of the vehicle itself, fuel and other fluids, passengers, and all cargo;

"highway" has the same meaning as in the *Motor Vehicle Act*;

"worker transportation vehicle" means a motor vehicle provided by or arranged by an employer to transport 3 or more workers to and from, or to or from, a workplace.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.1 Application

This Part applies to all persons, including the operator, engaged in transporting workers by any type of conveyance operated on behalf of the employer.

Note: This Part is not intended to apply to transportation of a worker by a public transportation system such as a taxi, bus line, chartered air service or airline, or by a worker's personal transport on public roads prior to or following a work shift. The requirements for all-terrain vehicles are provided in Part 16 (Mobile Equipment).

17.1.1 General responsibilities

Vehicles used to transport workers must be designed, maintained and operated in a safe manner.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.1.2 Provision for seating and seat belt assemblies

If a worker transportation vehicle is used off a highway, the seating requirements under Division 39 of the Motor Vehicle Act Regulations and the seat belt assembly requirements of Section 220 of the *Motor Vehicle Act* apply as if the vehicle were operated on a highway.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.2 Employer's responsibility

If workers are to travel in a worker transportation vehicle, the employer must ensure that

(a) reasonable measures are taken to evaluate road, weather and traffic conditions to ensure the safe

transit of the workers,

(b) an inspection of the worker transportation vehicle has been conducted by a qualified person before first use on a work shift, and

(c) any defect which might affect the safety of workers is corrected before the vehicle is used.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.2.1 Operator responsibility

(1) The operator of a worker transportation vehicle must ensure that the worker transportation vehicle has been inspected by a qualified person before first use on a work shift.

(2) In addition to the requirements of section 17.1.2, the operator must not operate a vehicle in which there is a worker who occupies a seating position for which a seat belt assembly is provided unless that worker is wearing the complete seat belt assembly in a properly adjusted and securely fastened manner.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.2.2 General operation requirements

(1) A vehicle used to transport workers must be operated by a driver properly licensed under the provisions of the *Motor Vehicle Act* and, if required, the *Industrial Roads Act*.

(2) If a vehicle is used to transport workers the following procedures must be in place:

(a) all doors must be closed and latched while the vehicle is in motion;

(b) the parking brake must be engaged when the vehicle is left unattended and the wheels blocked or chocked if the circumstances require.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.2.3 Provision for seat belts

An exemption under Division 32, and an exception under Division 39, of the Motor Vehicle Act Regulations apply to the operation of a worker transportation vehicle both on and off a highway.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.3 Seat belts

Repealed. [B.C. Reg. 258/2008, effective January 1, 2009.]

17.4 Riding restrictions

A worker must not ride in a vehicle

(a) in a standing position, unless protected from being thrown off balance, or

(b) with any part of the body outside the vehicle unless essential to the work process, and then only if the worker is adequately restrained.

17.5 Securing equipment

(1) Materials, goods, tools or equipment carried in a portion or compartment of a vehicle in which workers are riding must be located and secured to prevent injury to the operator or workers.

(2) If materials, goods, tools or equipment are regularly carried in a worker transportation vehicle there must be a designated area in the vehicle for transporting these items.

17.5.1 Gross vehicle weight rating

The gross vehicle weight rating (GVWR) of the worker transportation vehicle must not be exceeded.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.6 Hazardous materials

The transportation of hazardous materials in a vehicle transporting workers is restricted as follows:

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

* See section 21.22 of the OHS Regulation.

(b) if it is necessary to carry volatile, flammable, or otherwise hazardous materials, the materials must be carried in isolated compartments which are

(i) accessible only from outside the vehicle, are securely fastened and are fitted with adequate ventilation and drainage facilities, and

(ii) if internal to the vehicle, separated from the crew compartment by an approved firewall.

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

17.7 Carrying animals

An animal must not be carried in the operator's cab or passenger compartment of a vehicle transporting workers unless appropriate facilities are provided for this purpose.

17.8 Passenger compartments

Any enclosed portion or compartment of a vehicle in which workers are transported must have

(a) effective ventilation, independent of doors, providing clean air,

(b) adequate lighting and means for heating and cooling,

(c) an effective means of communication between the operator and passengers, and

(d) more than one means of exit.

17.9 Boarding and leaving

(1) A worker must not board or leave any vehicle while it is in motion, except in case of emergency.

(2) Adequate docking facilities must be provided if necessary to ensure safe worker access and egress to marine craft and float-equipped aircraft.

(3) A walkway on a docking facility must have a surface finish or otherwise be maintained in a manner which minimizes the risk of a worker slipping.

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17.10 Vehicle design

(1) Vehicles operated by or on behalf of the employer primarily to transport workers must

(a) be of a design and construction acceptable to the Board,

(b) be suited to the type of use, terrain and weather,

(c) have bodies of strong and rigid construction, securely fastened to the vehicle chassis,

(d) have rear or side doors with latches operable from inside and outside, with side doors on the right side of the vehicle,

(e) be fitted with at least one emergency exit, on the left side or rear of the vehicle, operable from both inside and outside, and unlocked while the vehicle is in use,

(f) have safe means of entry and exit with non-slip steps and handholds,

(g) be fitted with adequate service brakes and a mechanical parking brake, and

(h) be equipped with appropriate first aid equipment determined under section 3.16 or 3.20, and with appropriate fire extinguishers in good working order.

(2) A vehicle used to transport workers off road must have

(a) service brakes capable of stopping and holding the fully loaded vehicle on the maximum slope the vehicle can climb or at the maximum specified operating slope,

(b) a primary and secondary braking system with the secondary braking system having at least 50% of the braking capability of the primary braking system,

(c) if components are shared between the primary and secondary braking systems, a design such that failure of any one component will not disable both brake systems,

(d) if the service brake operates on the drive train, a design such that failure of any one component of the drive train will not reduce the braking capability to less than 50% of the primary brake system, and

(e) a mechanical parking brake capable of holding the vehicle in place on a slope of at least 15%.

[Amended by B.C. Reg. 348/2003, effective March 30, 2004.]

17.11 Operation and maintenance

Repealed. [B.C. Reg. 258/2008, effective January 1, 2009.]

17.12 Seating design

A worker transportation vehicle must be equipped with seats that

(a) are safely located and securely attached to the vehicle, with a width of at least 41 cm (16 in) for each passenger and an upholstered seat and seat back which provide normal and comfortable seating for passengers,

(b) face to the front or rear of the vehicle, unless installed otherwise by the vehicle manufacturer, and

(c) provide a spacing of at least 66 cm (26 in) measured between the face of the seat back at seat level and the back of the seat or other fixed object in front.

17.13 Seating capacity

For vehicles that do not have seat belt assemblies in every seating position, the seating capacity must be determined by the number of 41 cm (16 in) seat widths available, provided the gross vehicle weight rating (GVWR) is not exceeded.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

17.14 Aisles

If a worker transportation vehicle will carry 12 or more passengers, it must have an aisle at least 25 cm (10 in) wide providing access from each seat to a regular entry/exit door, and also to an alternate or emergency exit.

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17.15 Compliance with regulations

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

17.16 Load rating

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

17.17 Safety standards

A vessel used to transport workers must meet generally accepted standards for safety and capacity based on the use of the vessel and the conditions in which the vessel could be expected to operate.

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

17.18 Operation

If the operator of a vessel transporting workers is not required to hold a certification under the *Canada Shipping Act*, the operator must

(a) have successfully completed a course on navigation and ship safety acceptable to the Board, or

(b) have other combination of training and experience acceptable to the Board.

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

17.19 Adverse weather

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

17.20 Life jackets

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

17.21 Fire extinguishers

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

17.22 Communication

(1) A vessel used to transport workers must be equipped with a two-way communication system of a design effective in the area of operation.

(2) The two-way communication system must be maintained in good operating condition, be able to establish contact with persons necessary to effect emergency response, and be immediately accessible in the event of an emergency.

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

17.23 Vessel preparation

Before transporting workers on a vessel, the operator of the vessel must ensure that the vessel is capable of safely making the passage, considering the

(a) stowage and securing of all cargo, skiffs, equipment, fuel containers and supplies,

(b) ballasting, and

(c) existing and forecast weather conditions.

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

17.24 Maintenance and inspection

(1) A vessel must be inspected before initial use to ensure that it is fit for safe operation, and after that at intervals that will prevent the development of unsafe conditions.

(2) Defects must be reported immediately, in writing, to the supervisor, employer or owner and those defects which affect the safe operation of the vessel must be remedied before the vessel is put to further use.

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

17.25 Anti-skid covering

A vessel used by workers wearing caulked boots must be fitted with deck matting or other covering which provides safe footing for workers, and the covering must be maintained in good condition.

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

17.26 Lighting

Searchlights or floodlights must be provided and used if necessary to facilitate safe operation of a vessel and to illuminate working or boarding areas adjacent to the vessel.

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

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17.27 Compliance with regulations

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

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Part 18 Traffic Control

Part 18 Contents

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18.1 Definitions

In this Part:

"traffic control" means the use of signs, flashing arrow boards, sign boards, buffer or shadow vehicles, barricades, cones, barriers, detours, traffic lights, traffic control persons (TCPs) or other techniques and devices to manage the flow of traffic;

"traffic control person" or *"TCP"* means any person designated or assigned by the employer to direct traffic.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.2 Responsibility

The employer must ensure that effective traffic control is provided and used whenever traffic could be hazardous to a worker.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.3 Standards for traffic control

Traffic control equipment, arrangements and procedures must meet the requirements of the latest edition of the *Traffic Control Manual for Work on Roadways* (the "*Traffic Control Manual*") issued by the Ministry of Transportation, unless otherwise specified by this Regulation.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.4 Supervision

(1) The employer must ensure that whenever traffic control is required, all of the following requirements are implemented:

(a) the traffic control arrangements and procedures for the work are made known to all the people involved in the work;

(b) the required traffic control devices and procedures are in place before the start of work and are

removed when they are no longer required;

(c) any person assigned to be a traffic control person is adequately trained in a manner acceptable to the Board and effectively performs their role in the traffic control arrangements and procedures for the work;

(d) a traffic control person is positioned in a safe location clear of potential environmental hazards such as a slide or avalanche;

(e) if 2 or more traffic control persons are required to work as a team at the worksite, responsibility for coordination of changes in traffic flow is assigned.

(2) The employer must ensure that during traffic control operations a supervisor is designated to ensure the requirements of subsection (1) (b) to (e) are met.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.5 Placement of traffic control signs and devices

(1) Traffic control signs and devices must be positioned and used as specified in the *Traffic Control Manual* and signs and devices must be located so as to allow traffic to move by or through the work area in a controlled manner and, if necessary, to come to a controlled stop with due regard for the prevailing weather and road conditions.

(2) Unless otherwise specified, all traffic control signs and devices must be installed and removed in a sequence which best protects workers during this phase of a traffic control operation.

(3) A sign advising of a traffic control person ahead must be placed in advance of each traffic control person's station, and this sign must be removed promptly when a traffic control person is no longer on duty at that station.

(4) Subsection (3) does not apply during emergency or brief duration work when it is not practicable to place such a sign, provided that sight lines and traffic speed allow oncoming traffic adequate warning of the work activity taking place.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

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18.6 Use of a traffic control person

(1) A traffic control person may be used only

(a) if the use of signs and other traffic control devices and procedures alone cannot provide effective

(b) during emergency or brief duration work if it is not practicable to control traffic with signs and other devices and procedures.

(2) Without limiting the generality of subsection (1), one or more traffic control persons must be used if

(a) it is necessary to institute a one-way traffic system by or through a work zone and the circumstances do not allow self-regulating single lane traffic controlled by signs and other devices as specified in the *Traffic Control Manual*, and a traffic signal system is not used,

(b) work-related traffic cannot safely self-regulate to move in or out of the work area or safely coordinate with other traffic,

(c) an existing traffic control system, or an existing traffic signal light system, is not adequate to regulate traffic,

(d) the work encroaches into an intersection so as to interfere with regular traffic movement,

(e) traffic speed or volume is a hazard to workers while setting up or removing other traffic control devices, or

(f) other traffic control devices are not available in an emergency situation.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.7 Traffic control person to remain on duty

The employer must ensure that a traffic control person is on duty at the assigned station whenever a traffic control person is required as part of the traffic control plan for the work.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.8 Location of traffic control persons

A traffic control person must

(a) stand in a safe position, preferably on the driver's side of the lane under the TCP's control, be clearly visible, and have an unobstructed view of approaching traffic, and

(b) be positioned at least 25 m (80 ft) away from the work area unless circumstances or space requirements, such as working at or near an intersection, dictate otherwise.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

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18.9 Operations during day time

Each traffic control person must be provided with, and must use, all of the following:

(a) a traffic control paddle meeting the requirements for a C-27H Traffic Control Paddle as specified in the *Traffic Control Manual* and, if necessary to control fatigue, a non-conductive support staff for the paddle;

(b) high visibility apparel meeting

(i) the Type 1 or Type 2 criteria of *WCB Standard Personal Protective Equipment Standard 2-1997, High Visibility Garment,* or

(ii) the Class 2 or 3 garment criteria of *CSA Standard Z96-02, High-Visibility Safety Apparel*, with a fluorescent background colour;

(c) wrist and lower leg bands fitted with a minimum 5 cm (2 in) wide fluorescent retroreflective strip about their entire circumference, except that wrist and lower leg bands are not required for a traffic control person performing this function on an emergency or a temporary basis and not as part of their normal duties;

(d) safety headgear of a high visibility colour with a strip of retroreflective tape across the top from front to back and on the sides;

(e) an effective means of communication when traffic control persons are not visible to each other, which under no circumstances means a system of passing batons or similar items to indicate the last vehicle traveling through the zone under control.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.10 Operations during night time or poor visibility

(1) During the hours of darkness, or in other conditions of poor visibility, each traffic control person must be provided with and must use, in addition to the equipment required by section 18.9, a flashlight fitted with a red signalling wand.

(2) For the purpose of subsection (1), the traffic control person must have immediate access to spare batteries for the flashlight.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.11 Equipment maintenance

All traffic control equipment and devices, including signs, traffic control paddles and personal protective equipment, must be kept clean and in working condition.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

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18.12 Precise motions

A traffic control person must make all traffic control directions and signals precisely and deliberately so that the meaning can be clearly understood.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.13 Standard signals between traffic control persons

If manual signals are used between traffic control persons to initiate changes in the direction of traffic flow, the signals shown in Figure 18-1 must be used.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.14 Standard signals for traffic

(1) All traffic control directions and signals made by a traffic control person for the purpose of controlling traffic must conform to the requirements of this Regulation and the *Traffic Control Manual*.

(2) A traffic control person must use the normal signals shown in Figure 18-2 when stationed on the driver's (left) side of the traffic lane under the TCP's control.

(3) The alternative signals shown in Figure 18-2 must be used only when the traffic control person is stationed on the passenger's (right) side of the traffic lane under the TCP's control.

(4) A traffic control person must not use their traffic control paddle to wave traffic on and must never display the paddle to traffic in other than a static manner.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

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18.15 Dust control

If traffic causes airborne dust to the extent visibility is reduced and interferes with effective traffic control or creates a hazard to workers, the employer must control the dust by the periodic application of water or other acceptable material to the grade surface to suppress dust.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.16 Long periods of delay

If traffic control operations will result in long periods of traffic delay, appropriate signs or other effective means must be used to inform the traffic of the situation.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

18.17 Towing and recovery operations

If the recovery of a disabled or damaged vehicle prevents the safe passage of other vehicles or if a passing vehicle is a danger to the workers engaged in the recovery operation, the person in charge must

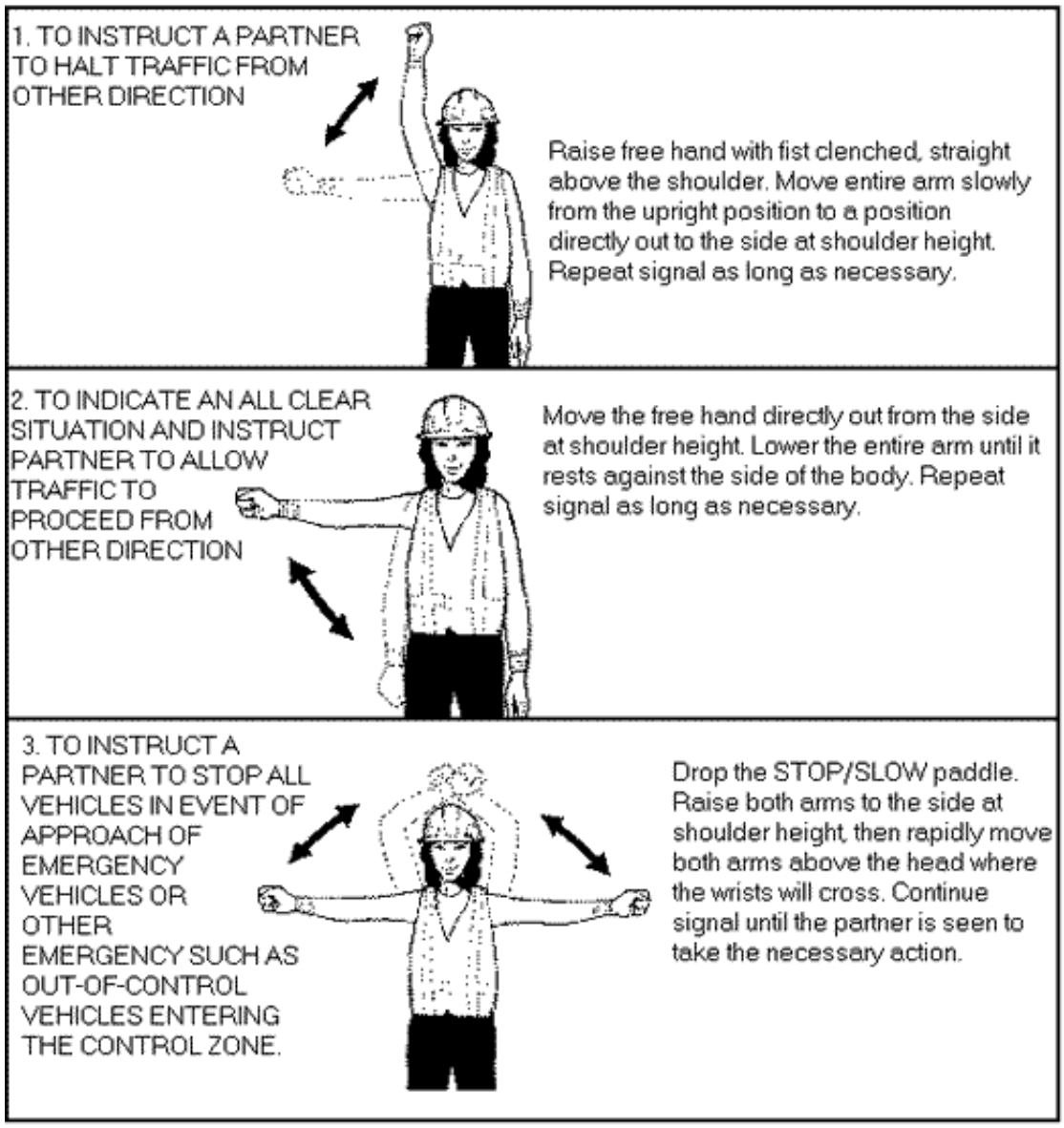
(a) warn traffic of the recovery operation by displaying appropriate signs and a 360° flashing light,

(b) ensure that workers wear appropriate personal protective equipment, and

(c) ensure that any other procedures required by the *Traffic Control Manual* are followed if the activity exceeds the limits for emergency or brief duration work.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

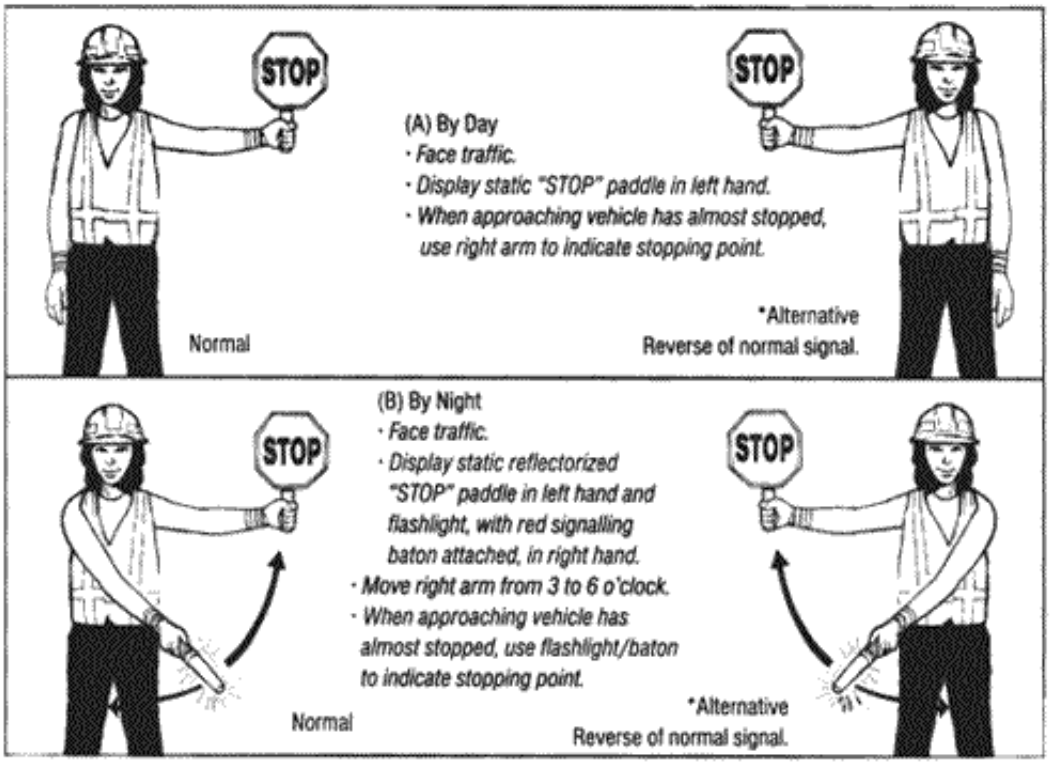
Figure 18-1: Arm signals between traffic control persons



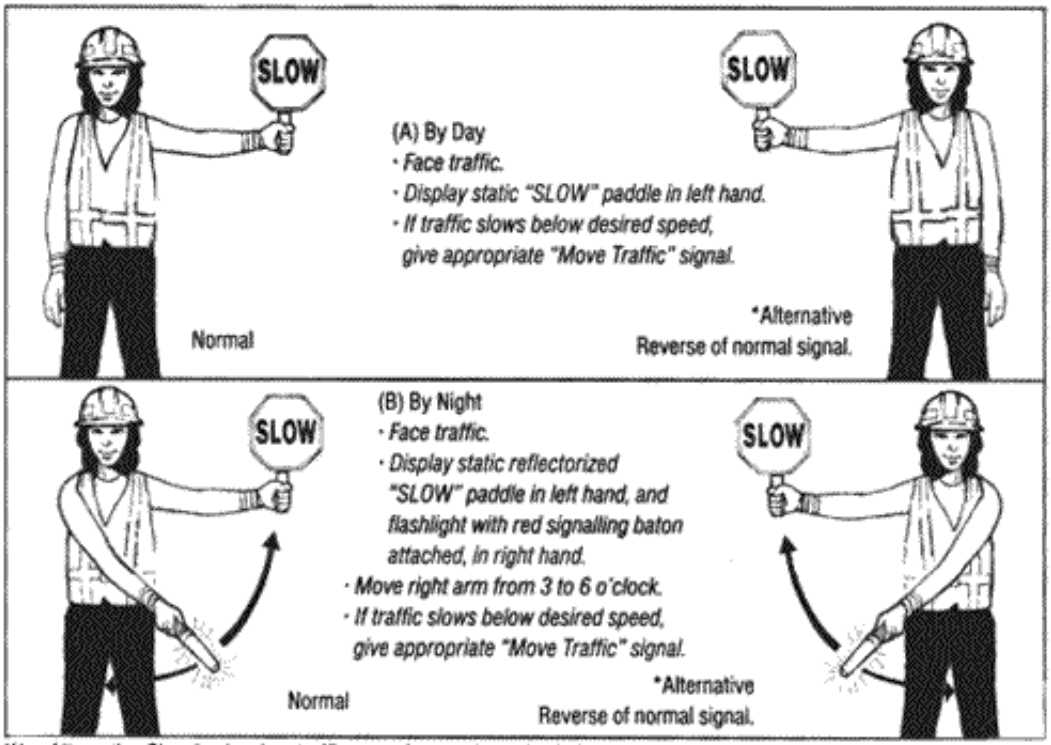
[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

Figure 18-2: Arm signals for traffic control

1 TO STOP TRAFFIC



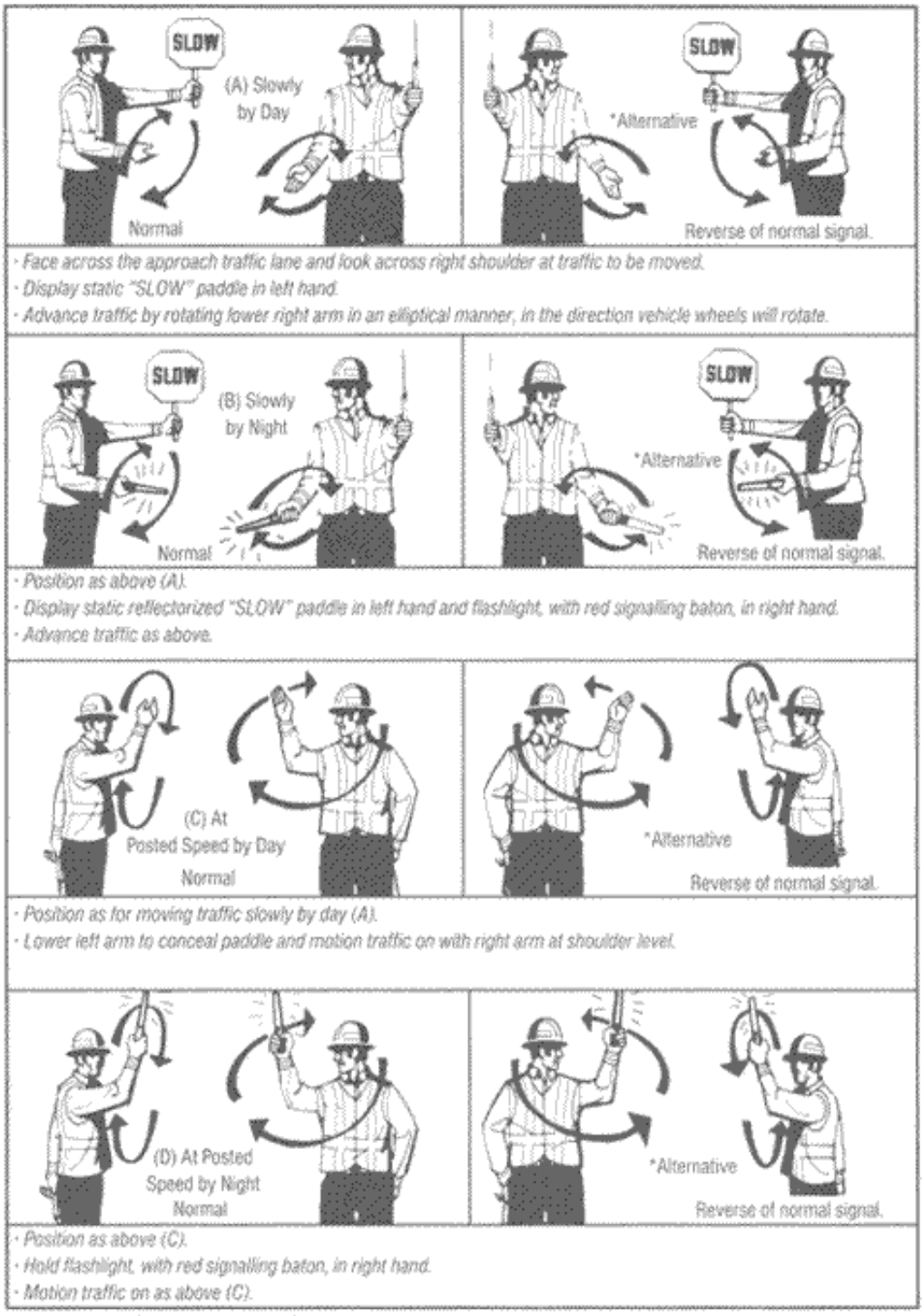
2. TO SLOW TRAFFIC



*Use Alternative Signal only when traffic control person's station is located on the right side of traffic under his or her control.

Figure 18-2: Arm signals for traffic control (Continued)

3. TO MOVE TRAFFIC



*Use Alternative Signal only when traffic control person's station is located on the right side of traffic under his or her control.

[Enacted by B.C. Reg. 242/2006, effective January 1, 2007.]

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Part 19 Electrical Safety

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19.1 Definitions

In this Part

"apprentice utility arborist" means a worker who is not yet a certified utility arborist but has completed a course of instruction recognized by the certifying authority;

"approved" as applied to electrical equipment, means that the equipment meets the requirements of the Electrical Safety Regulation;

"certified utility arborist" means a person who has completed a course of instruction, has a minimum of 1,200 hours of practical experience and is certified by an authority acceptable to the Board;

"conductor" means a wire, cable or other metal component installed for the purpose of conveying electric current from one piece of equipment to another or to ground;

"control system" means a manual, remote, automatic or partially automatic system for controlling the operation of equipment;

"damp location" means an exterior or interior location that is subject to condensation of moisture in, on or adjacent to portable electrical equipment;

"electrical equipment" includes machinery, plant, works, wires, pipes, poles, conduits, apparatus, appliances and equipment, designed or used, or intended for use, for or in connection with generation, transmission, supply, distribution or use of electrical energy for any purpose;

"electrical worker" means a person who meets the requirements of the Electrical Safety Regulation for installing, altering or maintaining electrical equipment;

"electrofishing" means the capture or control of fish by the use of electrical equipment;

"exposed", as applied to electrical equipment or conductors, means that the conductor or a part of the equipment is

(a) electrically connected to a source of voltage difference or electrically charged to have a voltage different from that of earth,

(b) not guarded or insulated in an approved manner, and

(c) in a location where a person or any tool, equipment or material the person is touching or using might come closer than a safe distance away from the conductor or part;

"hardwired" means the electrical connection of components within a system by means of electrical conductors so that the only way the system can be modified is by changing the connections;

"high voltage" means a potential difference (voltage) of more than 750 volts between conductors or between a conductor and ground;

"isolated" means that normal sources of energy have been disconnected by opening and securing all associated switches, and that mechanical equipment has been rendered and secured non-operative by disconnecting, stopping, depressurizing, draining, venting or other effective means;

"low voltage" means a potential difference (voltage) from 31 to 750 volts inclusive, between conductors or between a conductor and ground;

"mimic display" means a symbolic representation of the configuration and status of all or part of a power system, complete with device designations;

"power system" means all plant and equipment essential to the generation, transmission or distribution of electricity, including any plant or equipment that is out of service, being constructed or being installed;

"safety protection guarantee" means an assurance that a power system or part of the power system is

isolated and will remain isolated;

"safety watcher" means a qualified person whose sole task is to observe the activity when equipment, vegetation or material will be moved relative to energized electrical equipment or conductors, and signal in a clear and predetermined manner to stop the movement whenever contact with electrical equipment, conductors or guarding appears probable, or whenever conditions prevent the watcher from having a clear view of the movement relative to the electrical equipment;

"service room" means a room or space in a building provided to accommodate building service equipment, and meeting the requirements of the *BC Building Code* or other applicable legislation;

"vault" means an isolated enclosure, either above or below ground, with fire-resisting walls, ceilings and floors for the purpose of housing transformers and other electrical equipment;

"wet location" means an exterior or interior location in which uncontrolled liquid may drip, splash or flow on or against portable electrical equipment.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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19.2 Electrical qualifications

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

19.3 Poles and structures

(1) Before a worker climbs or is supported by a pole or structure, or before any work is done that will affect its stability,

(a) the pole or structure must be tested for soundness and stability, and

(b) if there is any doubt as to soundness or stability, the pole or structure must be effectively supported before any wires or cables are changed, and the supports must be left in place until workers are clear of the pole or structure.

(2) A worker must not climb or be on a pole or structure supported laterally by pike poles only.

19.4 Obstructions on poles

(1) Mailboxes, signs, clotheslines, or other obstructions are prohibited on or close to poles on which workers are required to work.

(2) Tags authorized by the owner which are placed on a pole for identification purposes must be less than 1.7 m (5.5 ft) above grade, on the side of the pole which a climbing worker will face.

19.5 Informing workers

A worker must be informed of the potential electrical hazards before being permitted to do work in proximity to energized electrical conductors or equipment.

Note: If excavating near underground utilities, refer to the excavation requirements in Part 20 (Construction, Excavation and Demolition).

19.6 Service rooms

If practicable, service rooms and electrical vaults must be used only for the purpose for which they were intended.

19.7 Space around equipment

(1) Passageways and working space around electrical equipment must be kept clear of obstructions, be arranged so as to give authorized persons ready access to all parts requiring attention, and not be used for storage.

(2) Flammable material must not be stored or placed close to electrical equipment.

19.8 Testing equipment

(1) Electrical testing equipment may be used if it meets the requirements of

(a) *CSA Standard C22.2 No. 160-M1985 (Reaffirmed 1992), Voltage and Polarity Testers*, or

(b) *CSA Standard CAN/CSA-C22.2 No. 231 Series-M89, CSA Safety Requirements for Electrical and Electronic Measuring and Test Equipment*.

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

(2) Electrical testing equipment not meeting a standard specified in subsection (1) may be used if it has

(a) fusing or circuitry designed to protect the operator in the event of a fault resulting from inadvertent misuse of the meter, or a fault on the circuit being tested,

(b) clearly and unambiguously marked measurement ranges,

(c) lead wire insulation rated to the maximum voltage reading of the meter,

(d) lead wires that are not cracked or broken, and having a current carrying capacity (ampacity) that meets or exceeds the maximum current measurement of the meter, and

(e) a minimum exposure of metal on lead wire probes.

(3) Appropriate safe work procedures must be established and followed for testing electrical equipment

and circuits.

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

19.9 Insulated elevating work platform

(1) In this section, *"elevating work platform"* has the same meaning as in section 13.1.

(2) The employer must ensure that, at least once every 12 months,

(a) an insulated elevating work platform intended for use by a worker is dielectrically tested in accordance with section 5.3.4 of *CSA Standard CAN/CSA-C225-10 Vehicle-mounted aerial devices*, and

(b) the insulating capability of the platform referred to in paragraph (a) is certified by the testing agency.

(3) If an insulated elevating work platform does not pass the testing required by subsection (2),

(a) the platform must be considered non-insulated, and

(b) the employer must ensure that

(i) any markings or identification on the platform indicating insulated capability are removed or effectively covered over,

(ii) the platform's inspection and maintenance records indicate the platform is non-insulated,

(iii) the platform's operation and maintenance manuals are revised to indicate the platform is non-insulated, and

(iv) before using the platform, workers are informed the platform is non-insulated.

[Enacted by B.C. Reg. 312/2012, effective February 1, 2013.]

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19.10 Disconnection and lockout

(1) Low voltage electrical equipment must be completely disconnected and locked out as required by this regulation before starting work on it.

(2) Except as specified in subsection (3), if it is not practicable to completely disconnect low voltage electrical equipment, work must be performed by qualified and authorized workers and in accordance with written safe work procedures which

(a) require the use of personal protective equipment and voltage-rated tools, appropriate to the hazards and risks associated with the voltage at which the electrical equipment is operating,

(b) provide that, if practicable, uncontrolled liquid is not permitted close to any worker working on the equipment, and

(c) if applicable, control the use of metal ladders, wooden ladders with wire reinforced side rails, metal scaffolds or metal work platforms.

(3) Work must not be done on energized parts of electrical equipment associated with lighting circuits operating at more than 250 volts-to-ground without the prior written permission of the Board.

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]

19.11 Warning signs

(1) Before completing installation and after energizing low voltage electrical equipment, conspicuous signs visible to workers must be placed close to the equipment stating "Danger, Energized Equipment".

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

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

19.12 Working close to energized equipment

(1) Uninsulated, energized parts of low voltage electrical equipment must be guarded by approved cabinets or enclosures unless the energized parts are in a suitable room or similar enclosed area that is only accessible to qualified and authorized persons.

(2) Each entrance to a room and other guarded location containing uninsulated and exposed, energized parts must be marked with a conspicuous warning sign limiting entry to qualified and authorized persons.

(3) If uninsulated energized parts are not guarded with approved cabinets or enclosures

(a) suitable barriers or covers must be provided if a worker unfamiliar with the hazards is working within 1 m (3.3 ft) of the uninsulated, energized parts, or

(b) the worker must be informed of the potential hazards, and provided with and follow appropriate written safe work procedures.

19.13 Identification of controls

Each electrical distribution switch, circuit breaker and control must be clearly marked to indicate the equipment it serves.

19.14 Grounding portable equipment

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

(2) Portable electrical equipment having double insulation or equivalent protection, and so marked, need

not be grounded.

(3) Portable electrical equipment, required to be grounded and not permanently connected to the wiring system, must be effectively grounded by the use of approved cords and polarized plugs inserted in grounded polarized receptacles.

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

19.15 Ground fault circuit interrupters

(1) When used outdoors or in a wet or damp location, portable electrical equipment, including temporary lighting, must be protected by an approved ground fault circuit interrupter of the class A type installed at the receptacle or on the circuit at the panel, unless another acceptable means of protection is provided.

(2) A ground fault circuit interrupter must not be used in place of grounding except as permitted by the Electrical Safety Regulation.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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19.16 Isolation and lockout

(1) High voltage electrical equipment must, if practicable, be completely isolated, grounded, and locked out as required by this Regulation before starting work on it.

(2) If it is not practicable to completely isolate high voltage electrical equipment,

(a) written safe work procedures acceptable to the Board must be followed,

(b) two or more qualified and authorized persons must be present while the work is being done, unless the procedures being followed under paragraph (a) specifically permit the work to be done by one person,

(c) appropriate electrical protective equipment, including rubber blankets, hoses, hoods, gloves and live line tools must be selected, used, stored, tested, and maintained in accordance with a standard acceptable to the Board, and

(d) the use of metal ladders, wire reinforced side rail wooden ladders, metal scaffolds or metal work platforms must be in accordance with the procedures established under paragraph (a).

19.17 Warning signs

(1) Before completing installation and after energizing high voltage electrical equipment, conspicuous

signs visible to workers must be placed close to the equipment stating "Danger -- Energized Equipment".

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

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19.18 Isolation and lockout

(1) Before working on a power system that for reasons of safety must be de-energized, the worker in charge must ensure that the part of the system being worked on is isolated and grounded, and locked out as required by this Regulation.

(2) Barriers or distinctive identification must be used to differentiate high voltage electrical equipment which has been de-energized for safety reasons from similar energized equipment at the work location if lack of such identification would result in undue risk to workers.

(3) If it is impracticable to lock out a power system or part of the power system

(a) the boundaries of the power system or part must be clearly defined,

(b) written work procedures governing the issue of safety protection guarantees, and which address the requirements of sections 19.19 to 19.23, must be followed, and

(c) all major equipment used to establish safety protection guarantees must be uniquely identified at a conspicuous place on or near the equipment.

19.19 Person in charge

(1) One person must be assigned at any one time the exclusive authority as the person in charge to establish the conditions for, and to issue safety protection guarantees for, the power system or a part of it.

(2) The person in charge must

(a) ensure that the status of the power system or assigned part of the power system is accurately represented on a mimic display,

(b) maintain a log of switching details, safety protection guarantees and operational events, and

(c) authorize the commencement of any work on the power system or assigned part of it.

(3) There must be an effective communication system between the person in charge and the workers doing the work.

(4) Only a worker specifically authorized by the owner may receive a safety protection guarantee or do

work on the power system.

19.20 Switching sequences

If a switching sequence requires the operation of 3 or more devices, a written switching order must be prepared and followed.

19.21 Isolating devices

(1) Isolating devices used for safety protection guarantees must provide for visual verification of the opening of the isolation point.

(2) Lockable isolating devices must be locked in the position or condition required to protect workers before work commences under a safety protection guarantee.

(3) A distinctive "DO NOT OPERATE" tag must be placed securely on each isolating device used for a safety protection guarantee.

19.22 Grounding and blocking

(1) After a safety protection guarantee is in effect, the equipment to be worked on must be tested to verify isolation before grounding and blocking begins.

(2) After testing to verify isolation, the person at the worksite responsible for each crew must verify that required grounding and blocking devices are in place before work begins.

(3) Grounding and blocking of any equipment that may be hazardous to workers must be carried out as close as practicable to the worksite.

(4) If grounding and blocking is not safe or practicable, written safe work procedures acceptable to the Board must be followed.

(5) Grounding and blocking devices may be removed for the purpose of conducting tests.

19.23 Multiple authorities

If a safety protection guarantee involves 2 or more power systems, or 2 or more persons in charge of different parts of a system, appropriate written procedures must be established and followed to ensure that any safety protection guarantee will be effective.

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Minimum Separation Distance to be Maintained From Energized High Voltage Electrical Equipment and Conductors

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19.24 Informing workers about high voltage electrical equipment and conductors

Before a person starts work close to high voltage electrical equipment or conductors that are exposed or that might become exposed during work at a workplace, the person must be informed of

(a) the existence, location and voltage of the high voltage electrical equipment and conductors, and

(b) the work arrangements and procedures to be followed to ensure compliance with this Part.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

19.24.1 Minimum approach distance when working close to exposed electrical equipment and conductors

Subject to section 19.24.2, or unless otherwise permitted by this Part, if exposed electrical equipment or conductors at a workplace have a voltage within a range set out in Column 1 of Table 19-1A, the following must remain at least the distance from the exposed electrical equipment and conductors that is set out in Column 2 opposite that range of voltage:

(a) a person working at the workplace;

(b) a tool, a machine, material or equipment at the workplace.

Table 19-1A

Column 1 **Voltage**	**Column 2** **Minimum approach distance for working close to exposed electrical equipment or conductors**	
Phase to phase	**Metres**	**Feet**
Over 750 V to 75 kV	3	10
Over 75 kV to 250 kV	4.5	15
Over 250 kV to 550 kV	6	20

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

19.24.2 Minimum clearance distance when passing under exposed electrical equipment and conductors

(1) This section applies in the circumstances where a person working at a workplace is moving or is involved in moving equipment under exposed electrical equipment or conductors and is not performing any work other than work related to moving the equipment.

(2) Unless otherwise permitted by this Part, in the circumstances set out in subsection (1), if exposed electrical equipment or conductors have a voltage within a range set out in Column 1 of Table 19-1B, the following must maintain at least the clearance distance from the exposed electrical equipment and conductors that is set out in Column 2 opposite that range of voltage:

(a) a person moving or involved in moving the equipment under the exposed electrical equipment or conductor;

(b) the equipment that a person referred to in paragraph (a) is moving;

(c) the load carried by the equipment referred to in paragraph (b).

Table 19-1B

Column 1 Voltage	Column 2 Minimum clearance distance for passing under exposed electrical equipment or conductors	
Phase to phase	**Metres**	**Feet**
Over 750 V to 75 kV	2	6.5
Over 75 kV to 250 kV	3	10
Over 250 kV to 550 kV	4	13

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

19.25 Assurance in writing

(1) If the minimum distance in Table 19-1A cannot be maintained because of the circumstances of work or the inadvertent movement of persons or equipment, an assurance in writing on a form acceptable to the Board and signed by a representative of the owner of the power system, must be obtained.

(2) The assurance must state that while the work is being done the electrical equipment and conductors will be displaced or rerouted from the work area, if practicable.

(3) If compliance with subsection (2) is not practicable the assurance must state that the electrical equipment will be isolated and grounded, but if isolation and grounding is not practicable the assurance must state that the electrical equipment will be visually identified and guarded.

(4) The safeguards specified in the assurance must be in place before work commences and effectively maintained while work is taking place.

(5) If guarding is used,

(a) neither equipment nor unqualified persons may touch the guarding, and

(b) a safety watcher must be designated, or range limiting or field detection devices acceptable to the Board must be used.

(6) The assurance must be available for inspection at the workplace, as close as practicable to the area of work, and must be known to all persons with access to the area.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

19.26 Assurance not practicable

(1) If exposed high voltage electrical equipment and conductors cannot be isolated, rerouted or guarded,

taken:

(a) the area within which equipment or materials are to be moved must be barricaded and supervised to restrict entry only to those workers necessarily engaged in the work;

(b) a safety watcher must be designated;

(c) a positive means must be provided for the safety watcher to give a clear, understandable stop signal to workers in the area, and the watcher must give the stop signal by no other means.

(2) While equipment is in motion in an area in proximity to energized electrical equipment or conductors, no person other than the equipment operator may touch any part of the equipment or the material being moved by it.

(3) No person may move a load or any rigging line from its position of natural suspension if it is in proximity to an energized electrical conductor or equipment.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

19.27 Specially trained

(1) A worker who has taken a course of instruction approved by the Board may work up to the adjusted limits of approach in Table 19-2 when all the following conditions apply:

(a) the high voltage electrical equipment is energized to a potential of not more than 75kV;

(b) the Board has determined that rerouting, de-energizing or guarding of the equipment is not practicable for the type of work being performed;

(c) the work is not being done for the owner of the power system;

(d) the work is of a type that must be done regularly;

(e) the worker follows written safe work procedures acceptable to the Board.

(2) A qualified electrical worker may work closer than the limits specified in Table 19-2 provided the worker is authorized by the owner of the power system and uses procedures acceptable to the Board.

Table 19-2: Adjusted limits of approach

Voltage Phase to phase	**Minimum distance**	
	Metres	Feet
Over 750 V to 20 kV	**0.9**	3
Over 20 kV to 30 kV	**1.2**	4
Over 30 kV to 75 kV	**1.5**	5

19.28 Emergency work

(1) Sections 19.24 to 19.27 do not apply to emergency actions close to energized high voltage electrical equipment or conductors carried out by workers who have undergone a course of instruction approved by the Board.

(2) During emergency actions, all reasonable precautions must be taken to control the hazards including, where practicable,

(a) restricting entry into the area within which equipment or materials are to be moved to workers necessarily engaged in the work,

(b) designating a safety watcher,

(c) when equipment is in motion, preventing a person other than the equipment operator from touching any part of the equipment or the material being moved by it, and

(d) requiring the equipment operator to operate the controls from the seat provided on the equipment, or from a metal stand that is integral with the frame of the equipment and clear of the ground, or from a metallic mat bonded to the frame of the machine and located on the ground beside the machine.

19.29 Authorization by owner

Qualified workers and workers under their direct supervision may work within the minimum distances to energized high voltage electrical equipment and conductors, as specified in Table 19-1A and Table 19-2, when authorized by the owner of the power system and using work procedures acceptable to the Board.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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Tree Pruning and Falling near Energized Conductors

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19.30 Preliminary inspection

(1) Before commencing tree pruning or falling close to energized high voltage overhead conductors, the worksite must be inspected by a qualified person, authorized by the owner of the power system, to identify any hazardous areas, including situations where any part of a tree to be pruned or felled is within the applicable minimum distance from an energized conductor as specified in Table 19-1A, or may fall within that distance.

(2) Immediately before commencing work, an inspection must be performed by a qualified person to verify the results of the initial inspection done under subsection (1) are still valid.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

19.31 Work in a hazardous area

Tree pruning or falling must not commence in a hazardous area until

(a) an assurance is issued by the owner of the power system that any reclose feature is disabled, and

(b) workers are informed of the voltages of the conductors.

19.32 Qualifications

Tree pruning or falling within the minimum distances in Table 19-1A from overhead energized high voltage conductors must be carried out by a worker authorized by the owner of the power system to do such work.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

19.33 Site crew requirements

Tree pruning or falling is not permitted within the minimum distances in Table 19-1A from overhead high voltage energized conductors, unless

(a) a certified utility arborist or a qualified electrical worker is present at the site and directing the work, and

(b) at least one additional qualified person, trained in appropriate emergency rescue procedures, is present.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

19.34 Limits of approach

(1) Subject to section 19.34.1, a certified utility arborist and any conductive tool must not be closer to an energized high voltage conductor than the applicable limit of approach in column B of Table 19-3.

(2) An apprentice utility arborist, except as provided in subsection (3), and any tool being used must not be closer to an energized high voltage conductor than the applicable limit of approach in column C of Table 19-3, or to any vegetation that is closer than the column C limit or that could swing closer while being cut.

(3) An apprentice utility arborist may work up to the limit of approach permitted for a certified utility arborist in subsections (1) and (5) if the apprentice utility arborist is in the presence of and under the direct supervision of a certified utility arborist.

(4) Vegetation closer to an energized high voltage conductor than the applicable limit in column B of Table 19-3 must be cut using approved insulated tools.

(5) An insulated tool acceptable to the Board may be used by a certified utility arborist

(a) up to the limit of approach in column A of Table 19-3, and

(b) from an insulated aerial device to remove vegetation closer than the limit of approach in column A of Table 19-3 up to but not touching an energized high voltage conductor of 75 kV or less.

(6) Vegetation touching an energized high voltage conductor or within the applicable limit in column A of Table 19-3 for a conductor at a potential of 75 kV or more may be removed only if

(a) the line is isolated and grounded by a qualified electrical worker, or

(b) the vegetation is removed by a qualified electrical worker who

(i) is authorized by the owner of the power system to remove the vegetation, and

(ii) uses insulated tools and work methods approved under the authorization referred to in subparagraph (i).

(7) Vegetation encroaching past the limits of approach in column B of Table 19-3 that cannot be removed using an insulated aerial device must be restrained from encroaching past the limit of approach in column A before removal.

(8) A tree must be topped before being felled, or other precautions must be taken to prevent the tree or any part of it from falling closer than the limit of approach in column A of Table 19-3.

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]

Table 19-3: Limits of approach for utility arborists

Voltage range	A. Insulated tool limit for certified utility arborists		B. Work limit for certified utility arborists		C. Work limit for apprentice utility arborists	
Phase to phase	**Metres**	Feet	**Metres**	Feet	**Metres**	Feet
Over 750 V to 20 kV	**0.3**	1	**0.9**	3	**3**	10
Over 20 kV to 30 kV	**0.5**	1.5	**1.2**	4	**3**	10
Over 30 kV to 75 kV	**0.9**	3	**1.5**	5	**3**	10
Over 75 kV to 250 kV	**2.1**	7	**3**	10	**4.5**	15
Over 250 kV to 325 kV	**2.6**	8.5	**4.5**	15	**6**	20
Over 325 kV to 550 kV	**3.7**	12	**6**	20	**6**	20

19.34.1 Crossing the neutral conductor

(1) In this section:

"cross the neutral conductor" means to move the platform of an insulated aerial device through the space between the neutral conductor of a power system and one or more overhead conductors;

"overhead conductor" means an energized high voltage conductor that is immediately above the neutral conductor of a power system

(2) This section applies if

(a) a certified utility arborist is on the platform of an insulated aerial device and intends to prune or remove vegetation in accordance with section 19.34,

(b) it is not practicable, because of terrain or other obstacles, to position the insulated aerial device in a location that is on the same side of an overhead conductor as the vegetation to be pruned or removed, and

(c) in order to move the platform of the insulated aerial device to the location described in paragraph (b), the certified utility arborist who is on the platform must cross the neutral conductor.

(3) A certified utility arborist who is crossing the neutral conductor in the circumstances set out in subsection (2) may come closer to an overhead conductor than the limits of approach under section 19.34 (1), but only if all of the requirements of this section are met.

(4) A certified utility arborist must not cross the neutral conductor unless

(a) the employer of the certified utility arborist has implemented written safe work procedures to ensure that all of the requirements of this section are met,

(b) the certified utility arborist has been trained in the work procedures referred to in paragraph (a),

(c) the certified utility arborist has demonstrated to the satisfaction of the employer that the certified utility arborist has the knowledge and ability necessary to cross the neutral conductor in accordance with

(i) the work procedures referred to in paragraph (a), and

(ii) the requirements of this section, and

(d) the certified utility arborist is satisfied that the clearance distances under subsection (5) (b) can be maintained at all times during the crossing.

(5) When the certified utility arborist is crossing the neutral conductor,

(a) the certified utility arborist must not perform any work other than work related to crossing the neutral conductor,

(b) if an overhead conductor has a voltage within a range set out in column 1 of Table 19-4, the following must maintain at least the clearance distance from the overhead conductor that is set out in column 2 opposite that range of voltage:

(i) the certified utility arborist;

(ii) the platform and the boom of the insulated aerial device;

(iii) any tool or device that is in or on the platform of the insulated aerial device, and

(c) a safety watcher who meets the requirements of subsection (6) must be present on the ground to assist the certified utility arborist in maintaining the clearance distances required under paragraph (b) of this subsection.

(6) The requirements for the purposes of subsection (5) (c) are as follows:

(a) the safety watcher must be trained in the work procedures referred to in subsection (4) (a);

(b) the safety watcher must have demonstrated to the satisfaction of the employer that the safety watcher knows

(i) the clearance distances that must be maintained under subsection (5) (b),

(ii) how to use the lower controls of the insulated aerial device, and

(iii) the procedure for rescuing a worker from the platform of the insulated aerial device.

(7) An apprentice utility arborist may work up to the limits of approach permitted for a certified utility arborist under this section if

(a) the apprentice utility arborist is in the presence of and under the direct supervision of a certified utility arborist,

(b) the certified utility arborist meets all of the requirements of subsections (4) (b) to (d), and

(c) the apprentice utility arborist complies with all of the requirements of subsections (4) and (5) and for this purpose, those subsections apply as if the apprentice utility arborist were a certified utility arborist.

Table 19-4

Column 1 **Voltage**	Column 2 **Minimum clearance distance from overhead conductor when crossing the neutral conductor**	
Phase to phase	**Metres**	**Feet**
Over 750 V to 20 Kv	0.60	2.0
Over 20 kV to 30 kV	0.75	2.5
Over 30 kV to 75 kV	0.90	3.0

[Enacted by B.C. Reg. 312/2012, effective February 1, 2013.]

19.35 Tree pruning and falling equipment

(1) An insulated tool must be used, stored, tested and maintained as required by section 19.16(2)(c).

(2) An insulated hand tool and insulated aerial device must be maintained in a clean condition and be dielectrically tested to a standard acceptable to the Board.

Note: An insulated aerial device is not considered an insulated tool.

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Control Systems

19.36 General requirements

(1) A control system must be designed, installed, operated and maintained in accordance with a standard acceptable to the Board.

(2) Only qualified and authorized persons may design, install, operate and maintain a control system.

(3) When designing a control system, the types of potential system failure and the effects of failures on the control system and the controlled equipment must be analysed.

(4) Where practicable and required to minimize risk to workers, a control system must be designed so that

(a) the controlled equipment cannot be inadvertently activated,

(b) an effective basic diagnostic capability is incorporated,

(c) hardwired emergency stop devices are provided at operator stations, and

(d) operator controls other than emergency stop devices can be activated at only one station at a time.

(5) A control system must be used to prevent automatic startup after a power interruption or low voltage occurrence, if automatic startup in such circumstances is likely to create a hazard to workers.

(6) A control system must, where practicable, be designed so that the controlled equipment does not create a hazard to workers if the system fails or is shut down.

(7) Equipment operated by a new or altered control system must not be used until the control system has been thoroughly checked and tested to verify that it will function in the intended manner.

(8) The employer must ensure there is up-to-date documentation which is readily available to affected workers describing the design, installation, operation and maintenance of a control system.

(9) Control system hardware must be protected from circumstances that could adversely affect the performance of the system including mechanical damage, vibration, extreme temperatures or humidity levels, high electromagnetic field levels, and power disturbances.

(10) Written safe work procedures must be developed for the use of equipment operated by a control system, including lockout procedures as required by this Regulation.

19.37 Programmable control systems

(1) The documentation provided for a programmable control system must include a copy of the control program that will allow the equipment to be reprogrammed if necessary to ensure the safe operation of the system.

(2) Only qualified and authorized persons may have access to the installed control system software.

19.38 Automatic control systems

Where practicable and required to prevent a hazard to workers, a control system must be designed so that during an automatic sequence

(a) the operator may make an emergency stop of the controlled equipment,

(b) the operator may, if safe, be allowed manual control of the equipment, and

(c) the sequence will abort when a protective timer completes its assigned time without an expected event occurring.

19.39 Remote control systems

(1) The maximum distance from which the operator may control equipment operated by a remote control system must be specified by the manufacturer.

(2) Written safe work procedures must be established

(a) that specify the maximum distance from which the operator is allowed to remotely control the equipment, and

(b) to ensure that workers remain at a safe distance from remotely controlled moving parts, and any remotely controlled mobile machine.

19.40 Wireless remote control

A wireless remote control system must incorporate

(a) error checking to prevent the controlled equipment from responding to corrupt data, and

(b) identification coding methods to prevent a transmitter other than the designated transmitter from operating the equipment.

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19.41 General requirements

The employer must ensure that

(b) workers are provided with a statement of their responsibilities and written safe work procedures, and

(c) workers are trained in and are knowledgeable of their responsibilities and work procedures.

19.42 Equipment approval

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

19.43 Manufacturer's instructions

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

* See section 4.3 of the OHS Regulation.

(2) Safe operating procedures from the manufacturer must be readily available for electrofishing equipment.

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

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20.1 Definitions

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;

"asbestos-containing material" has the same meaning as in section 6.1;

"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" 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;

"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;

"stockpile" means any soil or other loose material that is placed in an area for storage but that is not

intended to function as fill;

"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. 258/2008, effective January 1, 2009.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

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20.1A Qualified contractor

If a person agrees with the owner to be the prime contractor as provided in section 118 of Part 3 of the *Workers Compensation Act*, then that person must be qualified.

20.2 Notice of project

(1) The owner or, if the owner engages another person to be the prime contractor, then that person must ensure that the Board receives, in writing or by fax, a notice of project (NOP) at least 24 hours before starting a construction project if

(a) the total cost of labour and materials for the work exceeds $100 000, or

(b) all or part of the permanent or temporary works, except pre-engineered or pre-manufactured building and structural components, are required to be designed by a professional engineer, or

(c) the construction activity involves

(i) the removal, encapsulation or enclosure of friable asbestos-containing material, as that term is defined in section 6.1, or

(ii) the demolition, dismantling or repair of any building or structure, or parts thereof, in which asbestos-containing material has been used, or in which asbestos products have been manufactured, or

(iii) an abatement project or other activity involving significant disturbance of lead-containing coatings on buildings or structures, or

(iv) similar activities which may expose workers to a significant risk of occupational disease, or

(d) the construction project is a new erection, a major alteration, a structural repair or a demolition of

(i) a building more than 2 stories high or more than 6 m (20 ft) in height, or

(ii) a bridge, or

(iii) an earth or water retaining structure more than 3 m (10 ft) in height, or

(iv) a silo, chimney or similar structure more than 6 m (20 ft) in height, or

(e) workers will be working in a compressed air atmosphere or in a caisson, tunnel, underground working or cofferdam, or

(f) the construction project includes a trench more than 1.2 m (4 ft) in depth and over 30 m (100 ft) in length or includes another type of excavation more than 1.2 m (4 ft) in depth, which a worker may be required to enter.

(2) The notice of project required by subsection (1) must contain

(a) the name and address of the owner and, if applicable, any other person engaged to be the prime contractor for the project,

(b) the municipal address of the project, or its location in relation to the nearest highway,

(c) a description of the project including a list of the applicable items in subsection (1),

(d) the starting date and the anticipated duration of the project,

(e) the estimated total cost of labour and materials for the project, and

(f) if the project involves an activity listed in subsection (1)(c), detailed written work procedures which will be used to minimize the risk to workers who might be exposed to a hazardous material specified by that subsection.

(3) A copy of the notice of project must be posted at the construction site before work commences.

(4) If it is necessary to do immediate work in order to prevent injury to workers or damage to property, work on the project may commence immediately, and the nearest Board office must be provided with an NOP at the earliest possible time.

(5) If a shaft, tunnel, underground working, caisson or cofferdam is to be constructed, the notice of project must confirm that drawings for all temporary and permanent ground support will be available on site for the duration of the project.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

20.3 Coordination of multiple employer workplaces

(1) If a construction project involves the work of 2 or more employers or their workers, each employer must notify the owner, or the person engaged by the owner to be the prime contractor, in advance of any undertaking likely to create a hazard for a worker of another employer.

(2) If a work location has overlapping or adjoining work activities of 2 or more employers that create a hazard to workers, and the combined workforce at the workplace is more than 5

(a) the owner, or if the owner engages another person to be the prime contractor, then that person must

(i) appoint a qualified coordinator for the purpose of ensuring the coordination of health and safety activities for the location, and

(ii) provide up-to-date information as specified in subsection (4), readily available on site, and

(b) each employer must give the coordinator appointed under paragraph (a)(i) the name of a qualified person designated to be responsible for that employer's site health and safety activities.

(3) The duties of the qualified coordinator appointed under paragraph (2)(a)(i) include

(a) informing employers and workers of the hazards created, and

(b) ensuring that the hazards are addressed throughout the duration of the work activities.

(4) The information required by subsection (2)(a)(ii) includes

(a) the name of the qualified coordinator appointed under subsection (2)(a)(i),

(b) a site drawing, which must be posted, showing project layout, first aid location, emergency transportation provisions, and the evacuation marshalling station, and

(c) a set of construction procedures designed to protect the health and safety of workers at the workplace, developed in accordance with the requirements of this Regulation.

Note: The information required by subsection (4) is a part of the overall health and safety program required by Part 3 of this Regulation (Rights and Responsibilities). See sections 118 and 119 of Part 3 of the *Workers Compensation Act* for the statutory requirements for coordination at multiple employer workplaces and the general duties of owners.

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20.4 Safe access

(1) Where practicable, suitable ladders, work platforms and scaffolds meeting the requirements of Part 13 (Ladders, Scaffold and Temporary Work Platforms) must be provided for and used by a worker for activities requiring positioning at elevations above a floor or grade.

(2) There must be suitable access for the safe delivery of equipment and materials to locations in the workplace where they will be used.

[Enacted by B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

20.5 Temporary floors

(1) During the erection of a building or structure of skeleton construction, a temporary floor, decking or formwork must be installed at the main working level where work is being done.

(2) If compliance with subsection (1) is not practicable, a temporary floor or other effective means of protection must be installed not more than two levels or 8 m (25 ft) below the main working level.

(3) Subsections (1) and (2) do not apply during the initial connection of structural members where it is not practicable to provide a floor or decking.

(4) There must be a safe means of access and egress to each main working level referred to in subsection (1).

(5) A stairway comprised of at least framing, treads and a handrail must be provided to each floor level before construction of the next floor or deck surface is undertaken, and the treads on the stairway must not create a tripping or slipping hazard.

20.6 Design loads

(1) A temporary floor, decking, floor opening cover or formwork must be

(a) capable of supporting a uniformly distributed live load of at least 2 kPa (40 psf), or

(b) designed and installed in accordance with the written instructions of a professional engineer if the anticipated live load will be different than 2 kPa (40 psf) in which case a copy of the engineer's plan and specifications must be available at the workplace.

(2) Workers delivering materials to or working on a temporary floor, decking, floor opening cover or formwork must be aware of the safe carrying capacity of the surface and of precautions necessary to prevent overloading.

20.7 Fall protection

Repealed. [B.C. Reg. 420/2004, effective January 1, 2005.]

20.8 Floor and roof openings

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

* See section 4.59 and Part 11 (Fall Protection) of the OHS Regulation.

20.9 Protection from falling materials

(1) If falling material could endanger workers

(a) the danger area must be barricaded or effectively guarded to prevent entry by workers, and

conspicuous warning signs must be displayed on all sides and approaches, or

(b) adequate protective canopies must be installed over the danger area, or

(c) adequate catch platforms or nets must be provided to stop materials from falling into areas accessible to workers.

(2) Temporary washroom facilities, offices and similar structures on a construction site must be

(a) located outside areas where there is the potential of being hit by falling materials, or

(b) covered by adequate protective canopies.

(3) Protective canopies must be designed and constructed to safely support all loads that may reasonably be expected to be applied to them, but in no case less than 2.4 kPa (50 psf).

20.10 Chutes

(1) Chutes must be provided if the free fall of materials or debris being removed exceeds 6 m (20 ft).

(2) Vertical chutes must be completely enclosed and have gates at each point of entry.

(3) The discharge area of a chute must be barricaded or effectively guarded to prevent workers being injured by falling or flying debris and conspicuous signs must be posted near chute outlets to warn of the danger.

20.11 Safety headgear

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

20.12 Glass panels

Glass panels installed during construction or alterations must be marked to clearly indicate their presence or effectively guarded at the time of installation.

20.13 Thrust-out crane landing platforms

(1) A professional engineer must certify each thrust-out crane landing platform and certify that the building structure can adequately support loads to be imposed by use of the platform.

(2) Thrust-out crane landing platform drawings and certification must be available on site when the platform is in place.

(3) The rated capacity of a thrust-out crane landing platform must be clearly marked on the platform and not be exceeded.

(3.1) Control measures acceptable to the Board must be implemented to ensure all loads placed on a thrust-out crane landing platform

(a) are safely supported, and

(b) can be safely attached to and detached from the rigging.

(4) Thrust-out platform decking and supporting members must be designed to safely support any concentrated loads that may be landed.

(5) Repealed. [B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 420/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 19/2006, effective May 17, 2006.]

20.14 Temporary support

During the erection or dismantling of a structure or equipment the employer must ensure that all partially assembled structures or components are supported as necessary to safely withstand any loads likely to be imposed on them.

20.14.1 Fills

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.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

20.14.2 Stockpiles

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.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

20.14.3 Unstable face of a stockpile

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.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

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20.15 Drawings and special procedures

During the construction of a bridge or a structure involving erection of skeleton structural members, documentation of all construction details that require engineering, including erection procedures, temporary bracing and falsework must be

(a) available at the worksite at all times during such work, and

(b) updated as necessary to show changes in details or site conditions, and each update must be certified by a professional engineer.

20.16 Walkways

A worker must not walk upon the surfaces of structural members that have shear connectors, dowels or other protrusions unless suitable walkways and runways are provided to eliminate the tripping hazard.

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20.17 Specifications and plans

(1) The employer must ensure that a set of plans and specifications meeting the requirements of *CSA Standard S269.1-1975, Falsework for Construction Purposes* and *CSA Standard CAN/CSA-S269.3-M92, Concrete Formwork* is prepared for the formwork for each job and for all items of concrete work, the failure of which could cause injury.

(2) Erection drawings and supplementary instructions for concrete formwork, falsework and reshoring must be certified by a professional engineer and available at the site during erection, use and removal of the concrete formwork, falsework and reshoring.

(3) The following types of concrete formwork require erection drawings and supplementary information certified by a professional engineer:

(a) flyforms;

(b) gang forms;

(c) jump forms;

(d) vertical slip forms;

(e) formwork more than 4 m (13 ft) in height;

(f) suspended forms for slabs, stairs and landings;

(g) beam forms;

(h) single sided forms over 2 m (6.5 ft) in height;

(i) cantilever forms;

(j) bridge deck forms;

(k) shaft lining forms;

(l) tunnel lining forms;

(m) forms so designated by the designer of the structure.

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

* See also section 4.4 of the OHS Regulation.

20.18 Supervision

(1) A qualified supervisor experienced in the construction of temporary support structures must supervise the erection and use of formwork and falsework.

(2) Workers must be properly instructed on the hazards that they may be exposed to and on the precautions to be taken while around or on formwork and falsework.

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

* See also section 117 of the *Workers Compensation Act*.

20.19 Erection drawing information

(1) Erection drawings and supplementary instructions must clearly show all information necessary to accurately and safely assemble the concrete formwork, falsework and reshoring to the design requirements.

(2) The documents required by subsection (1) must include at least

(a) erection drawings showing sufficient plan and section views and connection details, enlarged where necessary, to clearly describe the formwork and permit accurate assembly,

(b) the quality and grade of materials to be used for the components and their connection,

(c) an accurate description of proprietary items, including fittings, to permit field identification,

(d) the load bearing capacity required of the material upon which the sills are to be placed and, where necessary, details of procedures to be used to develop and maintain the required capacity,

(e) the minimum dimensions of sills or other foundation members,

(f) construction, erection and dismantling procedures which require special attention including, where applicable, handling multi-use formwork panels,

(g) details of supports necessary to maintain lateral stability and resist sidesway and racking, specifying the materials, dimensions and locations of external braces, ties, and other support devices,

(h) where structural components connect together, the connections detailed to prevent accidental displacement or rotation of the components,

(i) the reshore plan where applicable,

(j) details of the form or mould into which concrete will be placed,

(k) sufficient load and deflection information to permit a professional engineer to understand the design of the concrete formwork and falsework,

(l) the requirement for outstanding field design and detailing where applicable, and

(m) the sequence, method and rate of load placement to prevent overloading of any part of the formwork.

20.20 Responsibility for design

(1) A professional engineer must be responsible for all field designs, details and changes including the effect they may have on the original design.

(2) Field designs and changes must be documented as required by section 20.19 and must be available at the site before and during placement of concrete or other significant loading of the formwork or falsework.

20.21 Continuity of engineering

The employer, or if the formwork affects workers of more than one employer, the owner or principal contractor, must ensure continuity of design, construction and inspection in the event of a change of professional engineers, or if the separate work of 2 or more professional engineers is involved.

20.22 Equipment requirements

(1) Equipment, materials and hardware which cannot be identified as meeting the standards specified in the professional engineer's drawings and specifications must not be used.

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

* See section 4.3 of the OHS Regulation.

20.23 Concrete placing hazards

(1) Protruding ends of reinforcing steel which are hazardous to workers must be removed or effectively guarded.

(2) If a worker is required to be underneath the formwork during a concrete pour or placement of another significant load, the worker must be restricted from the areas where the loads are placed.

been placed on the formwork, workers must be restricted from the area under those portions of the formwork until it can be assured that the formwork will withstand the load.

(4) Placement of concrete or other loads must stop if any weakness, undue settlement or excess distortion of formwork of a type listed in section 20.17(3) occurs, and may only restart after the formwork has been repaired or strengthened as specified by a professional engineer.

(5) Loads must not be applied to uncured concrete structures except as permitted by the erection drawings and supplementary instructions.

Note: For the purposes of compliance with subsection (1) reinforcing steel may be bent back so as not to be a hazard to workers unless it presents a tripping hazard on a surface where workers would walk.

20.24 Flyform drawings

(1) Erection drawings must be detailed to show

(a) a plan view, a longitudinal section, and a cross section for each type of flyform panel, and

(b) the weight, the calculated position of the centre of gravity and the position of the pickup points for each type of flyform panel.

(2) The design on the erection drawings and supplementary instructions for a flyform panel must provide that as soon as a flyform panel is landed on a supporting surface, before anyone climbs or walks on the panel, and before reinforcing steel or concrete is placed on the panel, the panel must

(a) be able to resist a minimum horizontal load of 3.6 kN (800 lbs) applied in any direction on the top edge,

(b) have a minimum safety factor against overturning about any possible axis of

(i) 1.6 when dead load plus most severe live load configuration plus horizontal loads are considered, and

(ii) 2.0 when dead load plus most severe live load configuration or dead load plus horizontal loads are considered,

(c) have a minimum safety factor of 1.5 against the panel sliding along the supporting surface, and

(d) have flyform legs placed as necessary to attain the required safety factor against overturning.

(3) If any of the requirements of subsection (2) cannot be obtained for a panel, the panel must, before being unhooked from the crane or hoist, be secured to the permanent structure or an adjacent panel in a manner specified by the formwork designer.

(4) When all flyform panels have been assembled to form a continuous piece of concrete formwork, the concrete formwork and falsework must meet the requirements of section 20.17(1).

20.25 Flyform handling

(1) The erection drawings and supplementary instructions for flyforms must show a step by step procedure for all phases of each cycle of assembly, flying, use, dismantling, and reuse of each flyform

panel, including special procedures for non-typical floors.

(2) If any flyform panel is not inherently stable for all possible conditions of load, special notation on the flyform design documents must draw attention to the procedure for obtaining stability.

(3) The erection drawings and supplementary instructions required by subsections (1) and (2), including special procedures required for non-typical floors, must be made available to workers involved in any part of the assembly, flying, use, dismantling and reuse of each flyform panel.

20.26 Inspections

(1) Immediately before placement of concrete or other intended loading, the employer must ensure that the concrete formwork and falsework is inspected and an engineering certificate is issued by a professional engineer, which

(a) indicates the specific areas inspected,

(b) certifies that the concrete formwork and falsework has been erected in accordance with the latest approved erection drawings and supplementary instructions, and

(c) certifies that specified reshoring is in place.

(2) The certificate required by subsection (1) must be available at the site for inspection by an officer.

(3) If a gang form is being reused on the same jobsite with any modification to the gang form design or method of erection, subsection (1) applies in relation to the reuse of the gang form.

(4) If a gang form is being reused on the same jobsite without modification to the gang form design or method of erection certified under subsection (1), immediately before placement of concrete or other intended loading, the employer must ensure that the gang form is inspected by a qualified person who

(a) confirms that the gang form has been erected in accordance with the latest approved erection drawings and supplementary instructions, and

(b) documents the inspection and the confirmation under paragraph (a), including the specific location at which the gang form is being reused and the date of inspection.

(5) The documents required by subsection (4)(b) must be available at the site for inspection by an officer.

[Amended by B.C. Reg. 199/2014, effective February 1, 2015.]

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20.26.1 Definition

In sections 20.26.2 to 20.54, *"mast"* means a mounting or support structure, other than a truck or trailer, for a concrete placing boom.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

20.26.2 Application of regulation

Sections 20.31, 20.32, 20.37, 20.38, 20.40 (3), 20.43 (4) and 20.45 do not apply in relation to concrete pumps or placing booms manufactured on or after August 1, 2012.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

20.26.3 Standards

(1) The operation, inspection, testing and maintenance of a concrete pump or placing boom manufactured before August 1, 2012 must meet the requirements of *CSA Standard Z151-09, Concrete pumps and placing booms*, as set out in clauses 1.1 to 3 *[definitions],* 4.1.9.2.3, 4.1.18.2, 4.1.19.1, 4.2.1.1, 4.2.2, 5.1.1 to 5.3.4, 5.3.7 to 6.3.4 and 6.5.1 to 6.7.3, including any table, figure or annex referred to in those clauses.

(2) The design, manufacture, installation, operation, inspection, testing and maintenance of a concrete pump or placing boom manufactured on or after August 1, 2012 must meet the requirements of *CSA Standard Z151-09, Concrete pumps and placing booms*, as set out in clauses 1.1 to 3 *[definitions],* 4.1.1.2 to 5.3.4, 5.3.7 to 6.3.4 and 6.5.1 to 6.7.3, including any table, figure or annex referred to in those clauses.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

20.27 Equipment identification

(1) A mast must bear a legible identification plate specifying

(a) the manufacturer's name,

(b) the year of manufacture,

(c) the model and serial number, and

(d) Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

(e) the allowable load.

(2) Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

20.28 Manufacturer's, supplier's or integrator's manual

(1) The manufacturer's, supplier's or integrator's manual for a concrete pump or placing boom, comprised of the documentation listed in clause 4.1.18.1 of *CSA Standard Z151-09, Concrete pumps and placing*

booms, must be readily accessible to the operator and to maintenance personnel.

(2) The manufacturer's

(a) operation and maintenance manual for a mast must be readily accessible to the operator and to maintenance personnel, and

(b) instructions for erection and use of a mast must be readily accessible to the installer, the operator and to maintenance personnel.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

20.29 Inspection and maintenance records

Records of inspection and maintenance as required by Part 4 (General Conditions) of this regulation must be made by the equipment operator and other persons inspecting and maintaining a concrete pump, placing boom or mast.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

20.30 Pre-use inspection

(1) The operator must inspect a concrete pump, placing boom and mast and test its safety and control devices before use on each shift and record the results of the inspection and tests in accordance with section 20.29.

(2) Any defects found in the concrete pump, placing boom or mast must be recorded according to section 20.29 and reported immediately to the supervisor or employer, who must determine the course of action.

(3) If a defect may affect the safe operation of the concrete pump, placing boom or mast, the equipment must not be used until the defect has been remedied.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

20.30.1 Design and construction

A concrete placing boom, mast and other structural supports must be designed and constructed so that, when this equipment is operated in accordance with the manufacturer's intended use, stresses to the load bearing components do not exceed the components' structural limits and the equipment is capable of carrying out its design function with an adequate margin of safety.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

20.31 Controls

Controls for a concrete pump, placing boom or mast must have their function clearly identified, and be located and maintained to allow safe operation of the concrete pump, placing boom and mast.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

20.32 Hydraulic cylinders

(1) Hydraulic cylinders on a concrete pump, placing boom and mast must have pressure relief valves to prevent cylinder and boom damage due to excess pressure.

(2) Hydraulic holding valves must be used on a concrete pump, placing boom or mast if hydraulic hose or coupling failure could result in uncontrolled movement of mechanisms.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

20.33 Marking weight

A trailer or skid mounted concrete pump must have a permanent, legible notice stating the total weight of the unit.

20.34 Lifting a pump

A concrete pump may only be lifted using the lift points specified by the manufacturer or a professional engineer.

20.35 Securing a pump

The trailer or skid on which a concrete pump is mounted must be secured to prevent movement during pumping.

20.36 Emergency shutoff

Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

20.37 Agitator guarding

(1) Concrete pump agitator guarding must be maintained to the pump manufacturer's specifications, with reasonable allowance for wear.

(2) Bent bars in a concrete pump agitator grill guard must be repaired.

(3) Concrete pump grill bar spacing may be increased to a maximum bar spacing of 8 cm (3 1/4 in) when pumping concrete mixes with a slump of 5 cm (2 in) or less and provided specific instructions are given to the crew regarding the hazard present due to the larger openings in the grill guard.

(4) The distance from the grill bars to the concrete pump's agitator must be at least 7.5 cm (3 in).

(5) A concrete pump agitator grill guard must be hinged or bolted in place.

(6) A person must not stand on the grill when the concrete pump or agitator is running.

20.38 Engine exhaust

and hopper area.

20.39 Housekeeping

The deck area of a concrete pump must be kept clean and free of unnecessary objects.

20.40 Outriggers

(1) Outriggers must be used in accordance with the concrete placing boom manufacturer's specifications.

(2) Extendible outriggers for a concrete placing boom must be marked to indicate maximum extension.

(3) A concrete placing boom manufactured after January 1, 1999 must have its outriggers or jacks permanently marked to indicate the maximum load they will transmit to the ground.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

20.41 Use of placing boom

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

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

(3) Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

20.42 Pipe diameter and thickness

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

(2) The wall thickness of pipe mounted on a concrete placing boom must be sufficient to withstand a pressure greater than the maximum pressure that the concrete pump can produce in the concrete being pumped.

(3) Pipe sections must be replaced when thickness measurements indicate that wall thickness has been reduced to the limits specified by the manufacturer.

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

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

20.43 Pipe clamps

(1) Concrete must not be pumped through pipe with grooved ends, such as those for Victaulic-type couplers.

(2) Pipe clamps used with pipe carrying concrete must have a pressure rating at least equal to the pipe pressure rating.

(3) To ensure proper connection of concrete delivery pipes, pipe and pipe clamp contact surfaces must be

free of concrete and other foreign matter when a connection is being made.

(4) Quick connect clamps used on a concrete delivery pipe must be pinned or secured after installation to keep them from inadvertently opening.

20.44 Delivery pipe

Delivery pipe between the concrete pump and the placing system must be supported and anchored to prevent movement and excessive loading on pipe clamps.

20.45 Restraining devices

Restraining devices providing a safety factor of at least 5 must be used on attachments suspended from the placing boom or mast tip.

20.46 Concrete pump lines

(1) Concrete pump discharge line couplings, if located where inadvertent disconnection could cause injury to workers, must be guarded.

(2) The guards on a discharge line coupling must be positioned to effectively deflect in a safe direction any jet of concrete which might result from disconnection of the coupling.

20.47 Equipment inspection

(1) A mast must be inspected in accordance with good engineering practice at intervals not exceeding 12 months, repaired as necessary, and certified safe for use by a professional engineer, the manufacturer or the manufacturer's authorized agent.

(2) Despite section 20.26 of this regulation,

(a) a reference to a "qualified person" in clauses 5.2.2.2.1 to 5.2.2.2.3 of *CSA Standard Z151-09, Concrete pumps and placing booms*, must be read as a reference to a person who is a professional engineer, and

(b) a reference to a "person qualified to the requirements of *CSA W178.2* "or to a "representative authorized by the manufacturer" in clause 5.2.2.2.2 of *CSA Standard Z151-09, Concrete pumps and placing booms*, must be read as a reference to a person who is a professional engineer.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

20.48 Repair and modification

(1) Replacement parts used for repair of a concrete pump, placing boom or mast must meet or exceed the original manufacturer's specifications or be certified by a professional engineer.

(2) If a repair is made to a load bearing component of a concrete pump, placing boom or mast,

(a) the repaired component must meet or exceed the original manufacturer's specifications, or

(b) the repair must be certified by a professional engineer,

before the concrete pump, placing boom or mast may be operated.

(3) If a modification affecting the safe operation of a concrete pump, placing boom or mast is made to

(a) the structure,

(b) one or more mechanical components, or

(c) the control system

of the concrete pump, placing boom or mast, the concrete pump, placing boom or mast must be certified as safe for use by a professional engineer, the manufacturer or the manufacturer's authorized agent before it may be operated.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

20.48.1 Installation of mast

The design and installation of a mast must be

(a) in accordance with the manufacturer's specifications, or

(b) in the absence of manufacturer's specifications, certified by a professional engineer that the mast will safely support an allowable load.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

20.49 Boom and mast weight

The weight of each removable section of a concrete placing boom or mast must be permanently and legibly marked on the section.

20.50 Restriction on use

Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

20.51 Compressed air cleaning

Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

20.52 Operator's duties

Repealed. [B.C. Reg. 188/2011, effective February 1, 2012.]

20.53 Work near powerlines

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

20.54 Hopper signal device

If a concrete placing boom operator cannot see and monitor the hopper on the concrete pump from every location the operator must be at during the pumping activity, there must be a device at the hopper for the concrete delivery truck driver and other workers to signal the pump operator if there is a problem at the pump or hopper.

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20.55 Specifications and plans

(1) Before a tilt-up project begins the employer must ensure that a comprehensive set of plans and specifications is prepared, detailing

(a) all erection and bracing procedures,

(b) the type, size and location of all lifting inserts, brace inserts, braces, fittings and anchors for each panel,

(c) the required strength to be reached by the concrete before panel lifting can begin,

(d) the design wind pressure used to determine temporary bracing requirements,

(e) the wind gust speed above which the site must be cleared of workers when panels are supported by the temporary bracing,

(f) the requirements for supplementary reinforcing steel, strongbacks, or other reinforcement to be used during panel erection,

(g) the method of rigging for lifting and handling each panel,

(h) procedures for unique job conditions such as the method of temporary storage on site, and

(i) the weight of each panel.

(2) The plans and specifications for tilt-up panel erection and bracing must be certified by a professional engineer.

(3) Any change to the plans and specifications required by subsection (1), including the use of alternate accessories or erection and rigging procedures, must

(a) provide at least the same margin of safety as required by the original design and specifications, and

(b) be detailed on the documents and be certified by a professional engineer before it is carried out.

(4) One set of up-to-date certified plans and specifications must be maintained on site during lifting and as long as bracing is required to be in place, and the documents must be available for inspection by an officer.

20.56 Design requirements

(1) The plans and specifications for tilt-up panel erection and bracing must ensure that the load to be imposed on each lifting and bracing insert and anchor during panel lifting, moving and bracing will not exceed

(a) if a working load limit for the insert or anchor is not specified by the manufacturer, a maximum working load on the component determined by dividing the manufacturer's guaranteed minimum failure load by the applicable safety factor required by subsection (2) or (3), or

(b) if the working load limit or the manufacturer's guaranteed minimum failure load is not available, a maximum working load determined by calculating the ultimate load capacity in accordance with accepted engineering practice and the *BC Building Code,* and dividing this value by the applicable safety factor required by subsection (2) or (3).

(2) The minimum safety factor for cast-in lifting inserts is 2.5 except as provided in subsection 20.57(5); and for lift-points secured by drilled-in anchors, the minimum safety factor is 4.0.

(3) The minimum safety factors for bracing components are

(a) 1.67 for braces, and for the uplift or sliding of an anchor slab,

(b) 2.0 for cast-in brace inserts, and

(c) 2.5 for drilled-in bolt or expansion anchors, or greater if so specified by the manufacturer.

(4) The number of lift inserts for a panel must not be less than the total weight of the panel divided by the working load limit for the inserts in pullout and in shear.

(5) The temporary bracing for a tilt-up panel must be designed to resist the greater of

(a) an unfactored design wind pressure of 700 Pa (15 psf), or

(b) wind pressure calculated in accordance with the *BC Building Code* based on the probability of 1 in 10 of being exceeded in any year, as listed in the *Supplement to the National Building Code of Canada 1990* or as otherwise specified by the local building authority, multiplied by a pressure coefficient of 1.5.

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

20.57 Panel handling

(1) Tilt-up panel lifting and bracing operations must be done under the direct supervision of a qualified person.

(2) Tilt-up panel lifting must not start until the specified minimum concrete strength has been achieved, as verified through testing in a manner acceptable to the professional engineer responsible for the lifting and bracing design.

(3) A suitable bond breaker must be used to minimize adhesion of each tilt-up panel to the casting surface and wedges and pry bars must be used to assist in releasing the panel from the casting surface.

(4) Crane positions must, where practicable, be chosen to avoid blind lifts.

(5) If a blind lift is necessary, the crane must be located so that if a lift component fails the tilt-up panel will not contact the crane, and if such a crane position is not possible, the safety factor for the lifting inserts must be at least 4.0.

(6) Workers are not permitted in the danger area of the downside face of a tilt-up panel until all bracing components for the panel have been installed.

(7) If bracing or other attachments are required on the downside face of a tilt-up panel, they may only be installed after the panel is erect and is temporarily braced from the upside face as specified in the erection procedures.

(8) All specified tilt-up panel bracing including knee braces and any welded connection specified for temporary support must be installed as detailed before the hoisting rigging is slackened.

(9) Cross-lacing of knee bracing may be done after the hoisting rigging is disconnected but must be no more than one panel behind the lifting process.

(10) All specified bracing must be installed on erected tilt-up panels before leaving the site at the end of the work day.

(11) Drilled-in expansion bolts may only be used to secure braces if specifically authorized by the engineer responsible for the lift and bracing design.

(12) Tilt-up panel lifting must not be done if wind gust velocities exceed 55 km/h (35 mph).

(13) The job site and areas adjacent to braced tilt-up panels must be cleared of personnel if wind gust velocities exceed 100 km/h (60 mph).

20.58 Inspections

(1) The professional engineer who certified the erection procedure or the engineer's designated representative must inspect the site prior to the start of tilt-up panel lifting to ensure that lift procedures and temporary bracing requirements are understood, and a follow-up inspection must occur on the last day of tilt-up panel lifting to ensure that temporary bracing requirements have been met.

(2) Following each inspection required by subsection (1) the person inspecting must issue an inspection report addressing the matters specified in subsection (1) and a copy of the report must be maintained at the site while the temporary bracing system is in place.

(3) Work must not proceed on tilt-up panel lifting or in proximity to panels which have been temporarily braced until the relevant requirements of subsections (1) and (2) have been met.

20.59 Brace removal

The temporary bracing installed to support tilt-up panels must not be removed until the structural design engineer for the building provides a written statement that the tilt-up panels have been adequately

connected into the overall structure and the temporary bracing is no longer needed.

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Concrete Pre-Stressing and Post-Tensioning

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20.60 General requirements

(1) Concrete pre-stressing and post-tensioning operations must be done according to the specifications and instructions of a professional engineer, and a copy of such information must be available on site while the work is being done.

(2) Stressing operations must be carried out under the direction of a qualified supervisor.

(3) Workers involved in pre-stressing or post-tensioning must be instructed in and follow safe work procedures.

(4) Appropriate eye protection must be worn by all workers involved in grouting, stressing and cable trimming operations.

(5) Tendons, including bars, strands and wires, used for tensioning purposes must be protected against physical damage and corrosion during handling, transportation and storage.

(6) Strand couplers must not be reused until they have been inspected by a qualified person and determined to be safe for reuse.

(7) Welding, burning or other work must not be permitted on any surface where strands have been strung or tensioned unless proper care is taken to protect the strands from sparks or other heat sources and from stray electric currents.

20.61 Signalling devices and restricted areas

(1) Visual or audible signalling devices, or both must be provided and used in the area of tensioning operations to warn workers approaching the area.

(2) Workers not directly involved in tensioning or detensioning operations must be kept clear of the danger area and must remain clear until operations are completed and the visual and/or audible signals specified in subsection (1) are turned off or removed.

20.62 Strand measuring

Strand elongation and strand deflection must be measured by a means which does not expose the worker to a risk of injury.

(1) During pre-stressing operations workers must be protected by guards or other suitable devices at the tensioning ends and anchoring points to contain the flying strands and the strand vises in the event of strand failure.

(2) Guards must be fabricated from mild steel plate, not less than 6 mm (1/4 in) thick, or steel mesh with openings 25 mm x 25 mm (1 in x 1 in) or less that provides at least equivalent strength.

20.64 Deflecting devices

Deflecting devices must be designed to prevent slipout and to allow backing off of strands from the deflected position.

20.65 Detensioning and strand cutting procedures

(1) Written detensioning procedures must be prepared by a professional engineer and followed so that workers are not exposed to danger from equipment or strand failure or structural failure.

(2) Written procedures must be developed and implemented to safeguard the operator and other workers from hazards while cutting strands.

20.66 Strand vises and hydraulic devices

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

(2) Strand vises must not be reused until they have been inspected by a qualified person and determined to be safe for reuse.

(3) Damaged or worn vises and hydraulic equipment must be removed from service.

(4) The supervisor must ensure that operators are given the maximum allowable values for both stretch of the tendon and hydraulic pressure at the pump.

(5) If there is a significant difference between the expected value and the measured value for either stretch of a tendon or hydraulic pressure at the pump, the workers must stop operations on that particular tendon and consult with the professional engineer in charge to obtain instructions on how to proceed.

(6) Each jack pressure gauge must be checked at frequent intervals against a master gauge, and the site engineer must be furnished with a calibration chart.

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

20.67 Hydraulic equipment

(1) Only hydraulic pressure hoses with self-seating couplings may be used, and care must be taken to ensure that end connections are not subjected to bending stresses at any time.

(2) Hydraulic equipment must have a bypass valve which is adjusted and maintained to limit the hydraulic pressure so that the tension exerted by the jack on the tendon does not exceed 90% of the minimum specified ultimate strength of the tendon.

(3) Hydraulic hoses must be inspected for flaws, leaks or bubbles after each stressing operation, and any damaged hoses immediately removed from service.

(4) The hydraulic system must be regularly inspected for oil leaks and other damage and necessary corrective action taken.

20.68 Platform width

Where adequate clearance exists, the platform width at jacking locations must be at least 80 cm (32 in).

20.69 Blowouts

(1) Each blowout must be reported to the structural design engineer, investigated and logged.

(2) A copy of the logged entry must be available on site for reference purposes.

20.70 Tendon handling

If there is risk of injury from handling coiled post-tensioning tendons a suitable coil handling device must be used.

20.71 Securing jacks

All jacks must be secured to suitable anchors before they are installed on a cable for tensioning, and must not be unsecured before they are removed from the cable, if a falling jack could endanger workers.

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Open Web Joists and Trusses

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20.72 Erection instructions

(1) Work must not be undertaken on the erection of premanufactured open web joists and trusses until clear and appropriate written instructions from a professional engineer or the manufacturer of the joists or trusses, detailing safe erection procedures, are available at the worksite.

(2) Erection and temporary bracing of open web joists and trusses must be done in accordance with the written instructions required by subsection (1).

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Roof Work

20.73 Fall protection

Repealed. [B.C. Reg. 420/2004, effective January 1, 2005.]

20.74 Crawl boards and ladders

(1) Crawl boards or ladders used for roof work must be securely fastened over the ridge of the roof, or must be otherwise effectively anchored.

(2) The use of an eavestrough to support a crawl board or ladder on a roof is prohibited.

20.75 Steep roof requirements

If a worker is employed on a roof having a slope ratio of 8 vertical to 12 horizontal or greater, the worker must use a personal fall protection system or personnel safety nets must be used, and 38 mm x 140 mm (2 in x 6 in nominal) toe-holds must be used if the roofing material allows for it.

Note: Exposed horizontal roof strapping may be used as toe-holds as long as it provides safe footing.

20.76 Chutes and hoists

The roof edge about a chute, bitumen spout and material hoist must have guardrails meeting the requirements of Part 4 (General Conditions) or barriers of at least equivalent strength to at least 2 m (6.5 ft) on each side of such a work area.

20.77 Mechanical equipment

Mechanical or powered equipment which has the potential to push or pull a worker over an unguarded edge must not be used unless operated according to procedures acceptable to the Board.

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

* See also section 4.3 of the OHS Regulation.

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Excavations

20.78 Work standards

(1) Subject to this section, excavation work must be done in accordance with the written instructions of a qualified registered professional if

(a) the excavation is more than 6 m (20 ft) deep,

(b) an improvement or structure is adjacent to the excavation,

(c) the excavation is subject to vibration or hydrostatic pressure likely to result in ground movement hazardous to workers, or

(d) the ground slopes away from the edge of the excavation at an angle steeper than a ratio of 3 horizontal to 1 vertical.

(2) Despite subsection (1), excavation work described in that subsection must be done in accordance with the written instructions of a professional engineer if the excavation requires or uses support structures.

(3) The written instructions required by this section must

(a) be certified by the qualified registered professional concerned,

(b) be available at the site, and

(c) specify the support and sloping requirements, and the subsurface conditions expected to be encountered.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

20.79 Underground utility services

(1) Before excavating or drilling with powered tools and equipment, the location of all underground utility services in the area must be accurately determined, and any danger to workers from those utility services must be controlled.

(2) Excavation or drilling work in proximity to an underground utility service must be undertaken in conformity with the requirements of the owner of that utility service.

(3) Pointed tools must not be used to probe for underground petroleum and electrical utility services.

(4) Powered equipment used for excavating must be operated so as to avoid damage to underground utility services, or danger to workers.

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

20.80 Removing nearby hazards

Trees, utility poles, rocks and similar objects adjacent to an area to be excavated must be removed or secured if they could endanger workers

20.81 Sloping and shoring requirements

(1) Subject to section 20.78, 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 sides of the excavation are

(a) sloped as specified in writing by a qualified registered professional,

(b) 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 slope exceed that shown in Figure 20-1,

(c) benched as shown in Figure 20-2,

(d) supported as specified in writing by a professional engineer,

(e) supported in accordance with the minimum requirements of section 20.85, or

(f) supported by manufactured or prefabricated trench boxes or shoring cages, or other effective means.

(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

(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.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

20.82 Timber shoring and grades

(1) Timber shoring materials must be lumber graded Number 2 or better from the following species groups: Douglas fir-larch, hemlock-fir, spruce-pine-fir or coast-Sitka-spruce.

(2) All lumber must be graded to the National Lumber Grades Authority *Standard Grading Rules for*

Canadian Lumber.

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

20.83 Safe shoring procedures

(1) Shoring materials must be installed from the top down and removed in reverse order.

(2) Workers must not enter an excavation to remove shoring materials if ground conditions have deteriorated so as to make entry for shoring removal unsafe.

(3) Shoring or manufactured or prefabricated support systems must be installed in firm contact with the faces of the excavation, and in a manner which ensures no loss of soil from behind or below the bottom of the shield or shoring while the excavation is open.

(4) Unless otherwise indicated by the manufacturer or a professional engineer, in writing, voids between the shoring and the excavation face must be backfilled or blocked.

20.84 Manufactured shoring

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

20.85 Trench support structures

(1) Trench support structures, other than those designed by a professional engineer, must comply with Table 20-1 for the following relevant soil conditions:

(2) If Table 20-1 is to be used for a combination of supporting and sloping, the selection of shoring elements must be based on the overall depth of the excavation, and the arrangement must conform to Figure 20-3.

(3) Cross braces and trench jacks must be installed in a horizontal position and must be secured against dislodgment.

(4) The minimum number of cross braces at each cross bracing location is determined by the trench depth as follows:

Depth at location	Number of braces
up to 2.4 m (8 ft)	2
2.4 m to 3.7 m (8 ft to 12 ft)	3
3.7 m to 4.6 m (12 ft to 15 ft)	4
4.6 m to 6 m (15 ft to 20 ft)	5

(5) At each cross bracing location the cross braces must be less than 1.2 m (4 ft) apart, and the uppermost cross brace must be within 60 cm (2 ft) of ground level.

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

(7) Hydraulic or pneumatic trench jacks must have a means of ensuring that they will not collapse in the event of loss of internal pressure.

(8) Uprights must not spread outwards more than 15 degrees from the vertical when viewed along the trench.

(9) Plywood may be substituted for two inch thick shoring elements provided that

(a) the plywood is not less than 19 mm (3/4 in) thick,

(b) the trench is not over 2.7 m (9 ft) in depth,

(c) uprights are installed at not over 60 cm (2 ft) centres,

(d) cross braces do not bear directly on plywood, and

(e) cross braces bearing on uprights or walers are located at all joints in plywood sheathing.

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

20.86 Spoil piles

If the average depth of a spoil pile which is adjacent to a supported excavation exceeds 60 cm (2 ft), the selection of the shoring or shielding must take into account the resulting increase in lateral soil pressure.

Note: Table 20-1 includes an allowance for 60 cm (2 ft) of spoil pile adjacent to the excavation. In such cases shoring or shielding will be deemed acceptable if rated adequate for a tabulated depth equal to the depth of the excavation plus the average depth of the spoil pile minus 60 cm (2 ft). For other systems consult the manufacturer's instructions.

20.87 Entry and exit

(1) Safe means of entry and exit must be provided for an excavation a worker enters.

(2) If workers are required to enter a trench over 1.2 m (4 ft) deep, the safe point of entry and exit must be located within 8 m (25 ft) of the workers and the excavation must be safely supported or sloped to the entry and exit location.

(3) Walkways must be secured to prevent dislodgment.

(4) The open side of an access route into an excavation used by mobile equipment must have a curb.

20.88 Guarding

If an excavation is a hazard to workers, it must be effectively covered or guarded.

20.89 Excavation crossings

A walkway across an excavation must be at least 50 cm (20 in) wide, and if crossing an excavation over 1.2 m (4 ft) deep, be equipped with guardrails, meeting the requirements of Part 4 (General Conditions)

on both sides.

20.90 Excavated materials

(1) Excavated material must be kept back a minimum distance of 60 cm (2 ft) from the edge of a trench excavation and 1.2 m (4 ft) from any other excavation.

(2) Under no circumstances may excavated material be piled so that it endangers workers.

20.91 Use of skips or buckets

If a skip or bucket is used to remove material from an excavation, horizontal shoring members must be shielded from dislodgment with vertical planking.

20.92 Scaling and trimming

The sides of an excavation must be scaled and trimmed or otherwise stabilized to prevent slides of material or falls of rock which could endanger workers.

20.93 Height limitations

In pits, quarries and similar excavations the height of unstable faces must not exceed the maximum safe reach of the excavating equipment being used.

20.94 Positioning equipment

Whenever possible, power machines excavating banks must be positioned so that the operator is on the side away from the bank and with the boom positioned closest to the side of the excavation.

20.95 Water accumulation

(1) Water must not be allowed to accumulate in an excavation if it might affect the stability of the excavation or might endanger workers.

(2) Erosion of slopes by surface water must be prevented if workers may be endangered.

Table 20-1: Trench support structures

Size and spacing of members[1] (metric figures)						
UPRIGHTS			WALERS		CROSS BRACES	
Trench depth (m)	Minimum dimensions (mm)[2]	Maximum spacing (m)	Minimum dimensions (mm)[2]	Maximum vertical spacing (m)	width of trench (m) Up to 1.8 1.8-3.7 Minimum dimensions (mm)[2]	Maximum spacing (m)

					Vert-ical	**Hori-zontal**		
Type A: Hard and solid soil								
1.2-3 [3]	38 x 235	1.8	89 x 140	1.2	89 x 89	140 x 140	1.2	1.8
3-4.6	38 x 235	1.2	140 x 140	1.2	89 x 140	140 x 191	1.2	1.8
4.6-6	38 x 235	Close tight	140 x 140	1.2	140 x 191	191 x 191	1.2	1.8
Type B: Soil likely to crack or crumble								
1.2-3 [3]	38 x 235	1.2	89 x 140	1.2	89 x 140	140 x 140	1.2	1.8
3-4.6	38 x 235	0.9	140 x 191	1.2	140 x 140	140 x 191	1.2	1.8
4.6-6	38 x 235	Close tight	140 x 191	1.2	140 x 191	191 x 191	1.2	1.8
Type C: Soft, sandy, filled or loose soil								
1.2-3 [3]	38 x 235	Close tight	140 x 191	1.2	140 x 140	140 x 191	1.2	1.8
3-4.6	38 x 235	Close tight	191 x 191	1.2	140 x 191	191 x 191	1.2	1.8
4.6-6	64 x 235	Close tight	191 x 241	1.2	140 x 191	191 x 241	1.2	1.8

Size and spacing of members[1] (imperial figures)

UPRIGHT			**WALERS**		**CROSS BRACES**			
Trench depth (feet)	Minimum dimensions (inches)[2]	Max-imum spacing (feet)	Minimum dimensions (inches)[2]	Max-imum vertical spacing (feet)	width of trench (feet) Up to 6 6-12 Minimum dimensions (inches)[2]	Maximum spacing (feet)		
						Vertical	Hori-zontal	
Type A: Hard and solid soil								
4-10 [3]	2 x 10	6	4 x 6 [4]	4	4 x 4	6 x 6	4	6
10-15	2 x 10	4	6 x 6	4	4 x 6	6 x 8	4	6
15-20	2 x 10	Close tight	6 x 6	4	6 x 8	8 x 8	4	6
Type B: Soil likely to crack or crumble								
4-10 [3]	2 x 10	4	4 x 6	4	4 x 6	6 x 6	4	6
10-15	2 x 10	3	6 x 8	4	6 x 6	6 x 8	4	6
15-20	2 x 10	Close tight	6 x 8	4	6 x 8	8 x 8	4	6
Type C: Soft, sandy, filled or loose soil								

4-10 [3]	2 x 10	Close tight	6 x 8	4	6 x 6	6 x 8	4	6
10-15	2 x 10	Close tight	8 x 8	4	6 x 8	8 x 8	4	6
15-20	3 x 10	Close tight	8 x 10	4	6 x 8	8 x 10	4	6

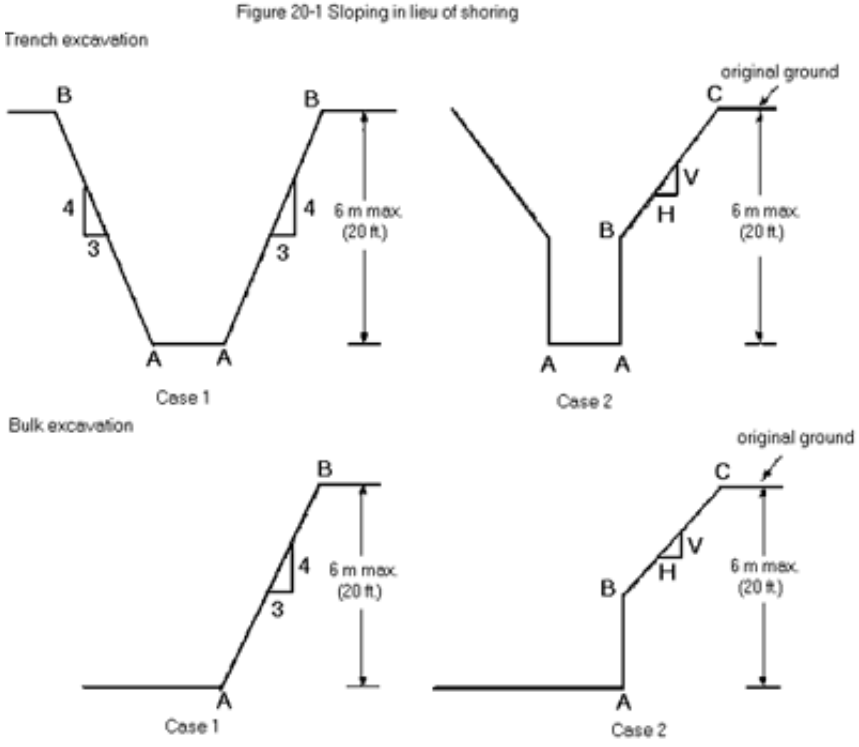
[1] The dimensions shown are minimum and must be increased if necessary to meet job conditions.

[2] The dimensions of members in millimetres are actual dimensions for surfaced dry materials. The dimensions in inches are the nominal values for surfaced dry materials.

[3] Trenches less than 1.2 m (4 ft) deep must be shored when hazardous ground movement may be expected, as in ground subject to hydrostatic pressure or vibration.

[4] Walers may be omitted in trenches not exceeding 2.4 m (8 ft) in depth provided that it has been confirmed that the soil is sufficiently hard and solid to safely permit waler deletion, and provided that the trench is not in proximity to previously excavated ground.

Figure 20-1: Sloping in lieu of shoring



Case 1 (trench or bulk excavation) - maximum slope of excavated face, shown as line AB, in hard and solid soil is 3 horizontal to 4 vertical.

Case 2 (trench or bulk excavation), maximum height of vertical portion, shown as line AB is 1.2 metres (4 feet).

For Case 2 (trench or bulk excavation), the maximum permissible slope of the excavated face BC for the corresponding height of the lower vertical cut AB is as follows:

		(in hard and solid soil)
centimetres	**feet**	
up to 30	up to 1	1 horizontal (H) to 1 vertical (V)
30 to 60	1 to 2	3H to 2V
60 to 90	2 to 3	2H to 1V
90 to 120	3 to 4	3H to 1V

Figure 20-2: Benching in lieu of shoring

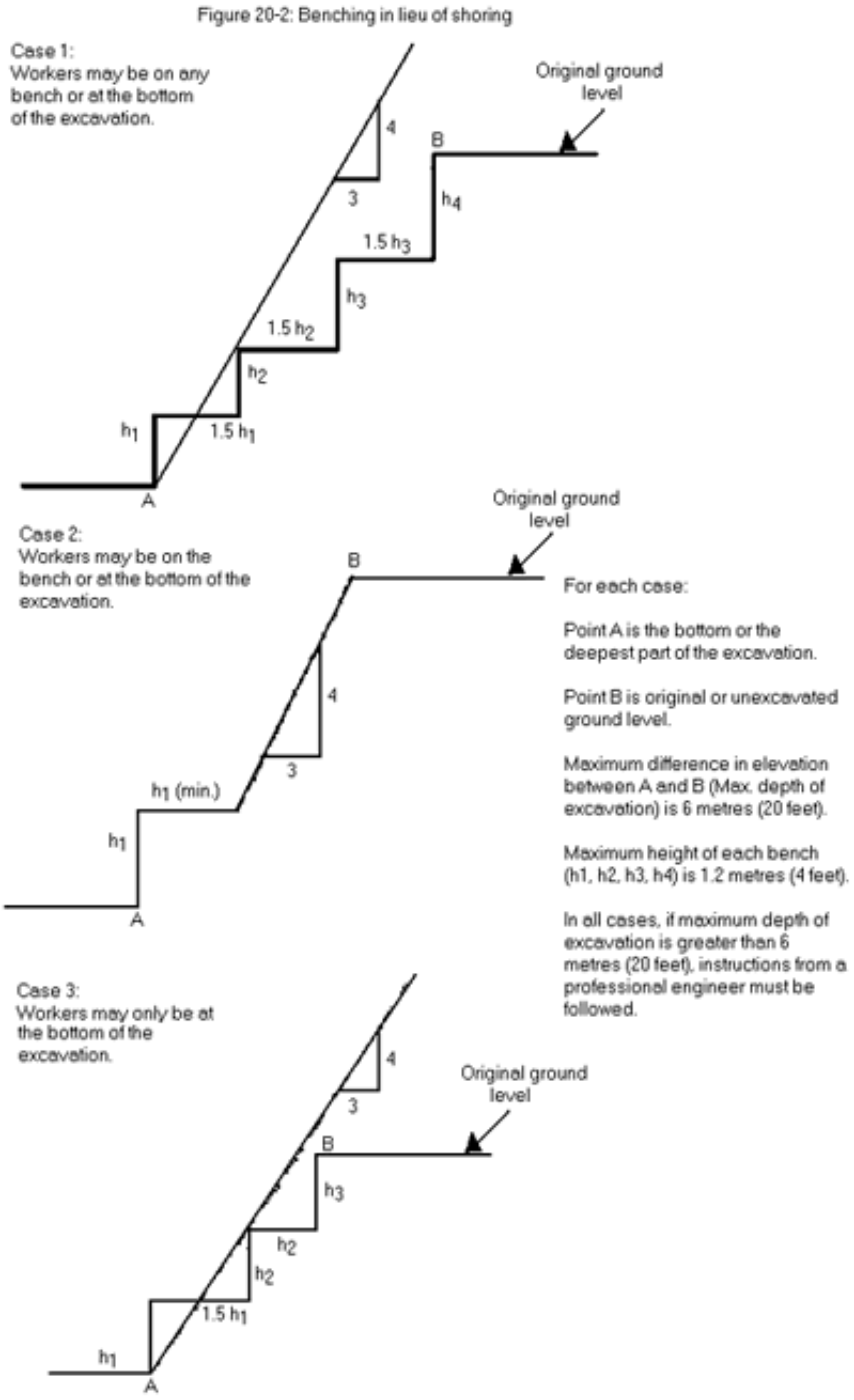
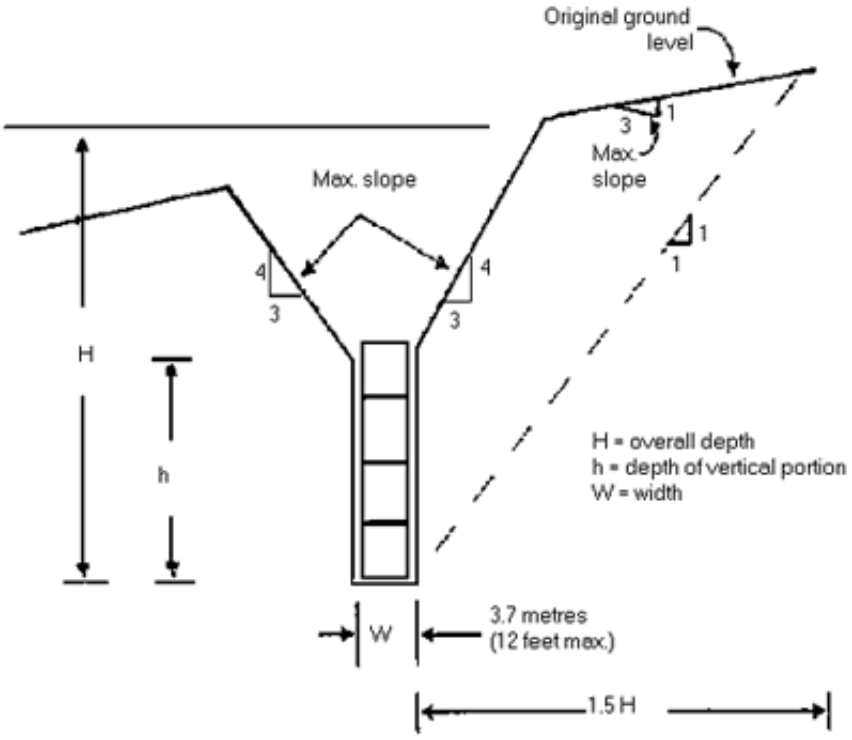


Figure 20-3: Combined supporting and sloping

Figure 20-3: Combined supporting and sloping



Shoring must be adequate for excavation depth H.
Depth H cannot exceed 6 metres (20 feet).

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20.96 Definitions

In sections 20.97 to 20.101

"rappel" means the method of moving down a face or other steep slope by means of a rope secured above and placed around a controlled descent device secured to a belt or harness worn by a worker, and payed out gradually in the descent;

"sit harness" means a body support device consisting of thigh and waist loops;

"work positioning" means a form of fall restraint that holds a worker in a work position.

20.97 Work from top down

Rock scaling and like work must be undertaken from the top down, and any area into which material will fall must be kept clear of workers and equipment.

20.98 Rappelling and work positioning systems

(1) A worker on a rock face or other steep slope must be protected from falling by a work positioning or rappelling system, or by a fall arrest system as required by Part 11 (Fall Protection).

(2) A single rope work positioning system may be used by a worker to rappel to and remain in work locations on a rock face or other steep slope if tension is maintained in the rappel rope at all times so that the worker is not exposed to a free fall.

(3) If the work practice could result in a slack line in the rappel or work positioning system and a fall could occur, a personal fall arrest system, independently anchored, meeting the requirements of Part 11 (Fall Protection) must be used.

(4) Rappelling techniques must provide for automatic stopping by means of a mechanical fall arrestor, Prusik sling or other device acceptable to the Board.

(5) A rappelling or fall protection system must be used in a manner that minimizes the swing-fall hazard.

20.99 Rappelling ropes

A rappelling rope must

(a) be synthetic fibre rope with a breaking strength specified by the manufacturer of at least 27 kN (6,000 lbs) or be at least 16 mm (5/8 in) diameter wire-cored fibre rope,

(b) be long enough to reach a safe landing spot from which egress without rappelling is possible, and

(c) not be lengthened by tying ropes together.

20.100 Anchors and other hardware

(1) The ultimate load capacity of an anchor for a rappelling or fall protection line must be at least 22 kN (5,000 lbs).

(2) Each rappel line and fall arrest lifeline that is tied to a natural anchor such a suitable tree, stump or rock outcrop must also be tied to a second anchor of at least equal load capacity.

(3) A rappelling rope must be attached to an anchor and, where practicable, must be positioned to avoid bearing on any sharp edge or surface likely to cause rope damage, and if it is not practicable to avoid sharp edges or surfaces, rope protectors or wire-cored rope must be used.

20.101 Harnesses

A sit harness with rope attachment below waist level may be used for work positioning or rappelling.

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Marine Construction, Pile Driving and Dredging

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20.102 Suspended work platforms

(1) Suspended work platforms such as gilley boards, small boats and buckets used to support workers must meet the requirements for suspended work platforms in Part 13 (Ladders, Scaffolds and Temporary Work Platforms).

(2) Despite section 13.27 (5), a secondary hoisting line on a crane may be used to suspend workers on a work platform in a marine construction or pile driving operation if

(a) it is not practicable to provide another means for positioning workers to perform work tasks,

(b) all of the crane's hoisting gear that is being used conforms to section 13.29 (1), and

(c) the total load attached to or suspended from all load lines of the crane does not exceed 50% of the rated capacity of the crane for the reach and configuration.

[Amended by B.C. Reg. 19/2006 effective May 17, 2006.]

20.103 Hoisting piles

When a pile is being hoisted in the leads only workers engaged in that operation may remain on the superstructure or in any area into which the pile could fall.

20.104 Operator protection

Each hoisting winch must have a suitable roof or shelter to protect the operator from falling objects, rigging failures and from the weather.

20.105 Exhaust discharge

Any exhaust gases and any air or steam discharge must be controlled so as not to harm workers or interfere with the ability of the operator or other workers to see the operation as necessary to work safely.

20.106 Chocking the hammer

(1) The pile driver operator must ensure that a suspended hammer is securely chocked when not in use.

(2) On a pile driver with swinging or suspended leads the hammer must not be raised until necessary.

20.107 Pile heads

(1) A head of a wooden pile must be

(a) cut square and cleaned of debris, bark and slivers before being driven, and

(b) trimmed to fit the follower or pile driving cap.

(2) The follower or pile driving cap being used must be of a size and type suitable for the type of piling being driven.

20.108 Cracked hammer

A drop hammer that is cracked must not be used.

20.109 Splicing

Ropes used to support the hammer of a pile driver must not be spliced.

20.110 Walkway on discharge line

(1) A worker must not be on a floating discharge line unless a walkway has been provided.

(2) The walkway on a floating discharge line must be at least 50 cm (20 in) wide, have guardrails meeting the requirements of Part 4 (General Conditions), and be adequately illuminated during night use.

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20.111 Structural integrity

(1) If a structure is to be demolished in whole or in part, the structure and any adjoining structures, the integrity of which could be compromised by the demolition, must be supported to the extent and in a manner prescribed by a professional engineer.

(2) Design of the support system described in subsection (1) must include a schedule, based on the stages of demolition, for installation of the components of the support system, and a copy of the support system plan must be available at the demolition site.

(3) While salvage is taking place before or during the demolition process, the integrity of the structure must be maintained.

(4) If the nature and method of demolition will not endanger workers and the stability of adjoining grounds and structures will not be compromised, engineered demolition plans and designs are not required.

20.112 Hazardous materials

(1) In this section

"hazardous material" means a hazardous substance, or material containing a hazardous substance, including

(a) asbestos-containing material,

(b) lead or any other heavy metal, or

(c) toxic, flammable or explosive material,

that may be handled, disturbed or removed in the course of the demolition or salvage of machinery, equipment, a building or a structure, or the renovation of a building or structure;

"qualified person", except in subsections (7) and (8), means a person who

(a) has, through education and training, knowledge of the management and control of the hazardous materials that the qualified person is made aware of by the employers, and the owner, or that are reasonably foreseeable by the qualified person, as being

(i) on or in the machinery, equipment, building or structure that is the subject of the demolition, salvage or renovation, or

(ii) at the worksite, and

(b) has experience in the management and control of those hazardous materials.

(2) Before work begins on the demolition or salvage of machinery, equipment, a building or a structure, or the renovation of a building or structure, all employers responsible for that work, and the owner, must ensure that a qualified person inspects the machinery, equipment, building or structure and the worksite to identify the hazardous materials, if any.

(3) In conducting an inspection and identifying the hazardous materials, if any, under subsection (2), a qualified person must do the following:

(a) collect representative samples of the material that may be hazardous material;

(b) identify each representative sample and determine whether it is hazardous material;

(c) if the actions under paragraphs (a) and (b) are not practicable, or not appropriate in the circumstances, use other sufficient means to identify the hazardous materials, if any;

(d) based on the actions taken under paragraphs (a) and (b) or (c), determine the location of each of the hazardous materials identified;

(e) make a written report of the inspection, including,

(i) if the actions under paragraphs (a) and (b) were taken,

(A) the location of each representative sample, and

(B) the identity of each representative sample and whether it is hazardous material,

(ii) if the actions under paragraph (c) were taken, the identity of each of the hazardous materials, if any,

(iii) a description of the methods used under paragraph (b) or (c),

(iv) the location, as determined under paragraph (d), of each of the hazardous materials identified, including by using drawings, plans or specifications, and

(v) the approximate quantity of each of the hazardous materials identified.

(4) All employers responsible for work being carried out on the worksite where the demolition or salvage of the machinery, equipment, building or structure, or the renovation of the building or structure is taking place, and the owner, must ensure that the following information is available at the worksite:

(a) a report made under subsection (3)(e);

(b) a report made under subsection (6)(e);

(c) a written confirmation under subsection (8).

(5) All employers responsible for containing or removing any of the hazardous materials identified under subsection (2) or (6) must safely contain or remove those hazardous materials.

(6) If, after written confirmation is provided under subsection (8), a person discovers material that may be hazardous material on or in the machinery, equipment, building or structure or at the worksite, not previously determined to be hazardous material under this section, all employers responsible for the demolition or salvage of the machinery, equipment, building or structure, or the renovation of the building or structure, and the owner, must ensure that a qualified person does the following:

(a) collects representative samples of the material;

(b) identifies each representative sample and determines whether it is hazardous material;

(c) if the actions under paragraphs (a) and (b) are not practicable, or not appropriate in the circumstances, uses other sufficient means to determine if the material is hazardous material;

(d) based on the actions taken under paragraphs (a) and (b) or (c), determines the location of the hazardous material, if any;

(e) makes a written report, including,

(i) if the actions under paragraphs (a) and (b) were taken,

(A) the location of each representative sample, and

(B) the identity of each representative sample and whether it is hazardous material,

(ii) if the actions under paragraph (c) were taken, the identity of the hazardous material, if any, and

(iii) if hazardous material was identified, the location of the hazardous material, including by using drawings, plans or specifications.

(7) All employers responsible for the demolition or salvage of the machinery, equipment, building or structure, or the renovation of the building or structure, and the owner, must ensure that, with respect to the hazardous materials identified under subsection (2) or (6),

(a) no demolition, salvage or renovation work that may disturb the hazardous materials, other than work necessary to safely contain or remove the hazardous materials, is carried out until the hazardous materials are safely contained or removed, and

(b) a qualified person complies with subsection (8).

(8) A qualified person must ensure, and confirm in writing, that the hazardous materials identified under subsection (2) or (6) are safely contained or removed.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

20.113 Disconnecting utility services

Demolition must not proceed until all utility services which may endanger a worker have been disconnected in the manner required by the owner of the applicable utility service.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

20.114 Glass removal

(1) If glass in a building or other structure could endanger workers it must be removed before other demolition commences.

(2) Glass removal must proceed in an orderly manner from the top to the bottom of the structure.

20.115 Overloading floors

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

20.116 Protection from falling materials

(1) If falling material could endanger a worker, the danger area must be guarded to prevent entry by workers or protected by adequate canopies.

(2) A floor or roof opening through which material may fall and endanger workers must be adequately covered.

20.117 Throwing material

If material is to be dropped or thrown from upper floors, the area into which the material will fall must be barricaded to prevent workers from entering the area and conspicuous warning signs must be displayed to advise of the danger.

20.118 Stabilizing walls

If a dangerous or unstable wall is to be left standing, it must be adequately braced.

20.119 Dismantling buildings

During the dismantling or renovation of a building or structure, materials of a size or weight which may endanger workers must not be loosened or allowed to fall, unless procedures are used that will adequately protect workers.

20.120 Housekeeping

Material and debris must not be allowed to accumulate on floors or on the ground outside the building or structure if workers will be endangered.

20.121 Stairways

Stairways, complete with handrails, must be left intact until access to the level they serve is no longer required.

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20.122 Medical fitness

Whenever work is carried out at an air pressure greater than 7 kPa (1 psi) above atmospheric pressure, the employer must ensure that the workers are medically examined by a physician knowledgeable in hyperbaric medicine, as required by the Board.

20.123 Compliance with standards

The employer must ensure that equipment and work processes carried out at an air pressure greater than 7 kPa (1 psi) above atmospheric pressure meet the requirements of *CSA Standard CAN/CSA Z275.3-M86, Occupational Safety Code for Construction Work in Compressed Air*.

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

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21.1 Definitions

In this Part

"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 area" means an area extending at least 50 m (165 ft) in every direction from a place where explosive materials are being prepared or fixed, or where an unexploded charge is known or believed to exist;

"blasting log" means a written record of loading details, and the site examination after the blast;

"blasting operation" includes preparing, placing, and firing a charge, handling a misfire, and destroying

or disposing of explosive materials;

"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 explosive materials which may or may not contain a primer, and which are placed for the purpose of detonation;

"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 blast;

"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 an unlicensed facility, not used for overnight storage, constructed to Type 6 magazine specifications pursuant to the *Explosives Act* (Canada);

"detonator" or "detonator products" includes those explosives commonly called blasting caps, or electric caps, or other similar devices used to detonate commercial explosives;

"explosive" means a substance that is made, manufactured or used to produce an explosion or detonation, including but not limited to blasting explosives, pyrotechnic devices and accessories containing explosives;

"igniter cord" means a small diameter wire coated with an incendiary composition used to ignite a series of safety fuse assemblies;

"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 structure used for the unattended storage of either detonators or explosives, and which meets the regulations and standards of the *Explosives Act* (Canada);

"misfire (mishole)" means a charge or part of a charge which, on initiation, failed to completely detonate or function, a dangerous condition;

"primer" means an explosive to which a detonator or other initiating device has been attached;

"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 a metal (aluminum or brass) clip or foil used to short out an electric detonator by interconnecting the leg wires, or means the act of shorting out leg wires by twisting them together;

"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.

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General Requirements

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.

21.3 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, detonators, and blasting machine used,

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

(f) the action taken by the employer.

21.4 Blasting log

(1) The blaster of record must record in a log the preblast loading details and the results of the postblast site inspection.

(2) Blasting logs must be maintained at the blasting site, 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.

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 blasting area 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.

21.6 Other legislation

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

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.

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21.8 Qualifications

A candidate for a blaster's certificate must

(a) be at least 18 years of age,

(b) demonstrate a satisfactory knowledge of the English language, both written and spoken,

(c) be physically capable of safely carrying out the duties of a blaster, and

(d) forward written proof acceptable to the examining officer that

(i) the candidate has had at least 6 months experience in blasting operations as an assistant to a blaster, and/or

(ii) the candidate's character, knowledge, qualifications and experience would make the candidate competent to handle explosives.

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.

21.9 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 his or her 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.

21.13 Suspension of duties

If, in the opinion of the employer, the holder of a blaster's certificate 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.

21.14 Submitting reports

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

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.

Note: Part 3 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 3 of the *Act* or this Regulation. When the Board has taken or is considering taking action under Part 3 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.

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Storage

21.16 Detonators

(1) Detonator products must not be kept in a store or receptacle in which explosives or safety fuses, fuse lighters, igniter cords or connectors are stored.

(2) At the loading site, detonator products must be stored separately from other explosives, and in a crush resistant box which is clearly identified.

21.17 Worksite storage

Explosives at the worksite must be guarded or contained in secured day boxes until used or returned to storage magazines.

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) A day box and receptacle used for day storage of explosives on a work site must, when they contain explosives, display signs indicating the presence of explosives in a conspicuous manner, and the signs must be removed when they are empty.

(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.

21.19 Magazine condition

(1) The interior of an explosives magazine must be kept scrupulously clean and must be constructed, covered or lined to prevent the exposure of any ferrous metals or gritty materials.

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

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

21.20 Cord

(1) Detonating cord must be stored separately, or with explosives other than detonators.

(2) Igniter cord must be stored separately from fuses, detonators, or explosives.

21.21 Separate handling

Blasting explosives and detonator products must be kept and handled separately until the last most practicable moment, before bringing them together.

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21.22 Vehicle operation

(1) A vehicle being used to transport explosives must be in sound mechanical condition, suitable for, and capable of, safely transporting explosives.

(2) Passengers, other than those assigned to assist in handling explosives, are not permitted on a vehicle transporting explosives.

21.23 Flammable materials

Reasonable quantities of flammable or combustible materials may be carried by a conveyance 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 on the conveyance.

21.24 Transportation of explosives

(1) Explosives carried in a vehicle must be in a fully enclosed, locked, fire resistant fixed container or compartment, separate from the passenger compartment.

(2) Electric detonators must be transported in their original containers, with their leg wires shunted, as shipped by the manufacturer.

(3) Detonators must be adequately separated from other explosives during transport.

21.25 Mobile drill rigs

The transportation of explosives on a mobile drilling rig is only permitted if

(a) explosives and detonators are carried in separate containers built to type 6 or type 10 magazine standard and capacities, with 2 hooded locks, and

(b) the explosives and detonator containers are

(i) located at least 60 cm (2 ft) apart, with the doors or lids facing at least 90° apart,

(ii) located above the vehicle deck in a manner which protects the containers from contact with roadside objects and the drilling equipment,

(iii) located so the contents are not endangered by any heat source on the drill unit,

(iv) kept locked when outside the blasting area, and securely closed when in the blasting area, except when opened for depositing or removing their contents, and

(v) attended by the blaster of record, or a qualified person designated by the blaster, at all times when explosives are being carried.

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

21.26 Water transport

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

21.27 Contact with metal

Contact between packages containing explosives and exposed ferrous metal in a conveyance must be prevented by the use of wood, tarpaulin, or other suitable dunnage materials.

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

(a) must operate the vehicle in a safe manner, consistent with prevailing road and weather conditions, and

(b) must not drive faster than 90 km/h (55 mph).

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

21.30 Vehicle load limit

A vehicle transporting explosives must not be operated or permitted to operate if the load to be transported exceeds 80% of the manufacturer's rated carrying capacity for the vehicle.

21.31 Firefighting equipment

(1) A conveyance transporting explosives must be equipped with at least 2 fire extinguishers, of a type capable of quickly extinguishing gasoline, oil, or electrical fires.

(2) The fire extinguishers must be readily available for use and must have

(a) a minimum 5 BC rating for a vehicle with up to 2 000 kg (4 400 lbs) gross vehicle weight (GVW) rating, and

(b) a minimum 10 BC rating for a vehicle with more than 2 000 kg (4 400 lbs) GVW rating.

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

Explosives must not be loaded on or in a vehicle unless the vehicle has been fully serviced.

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.]

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21.36 General

Explosive materials must be stored, transported, handled and used in the manner recommended by the manufacturer.

Explosive materials or accessories which have deteriorated, or are believed to be defective, must not be used and must be handled and disposed of in a safe manner following the manufacturer's recommendations.

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 Abandoned explosives

Explosive materials and accessories must not be abandoned, but must be placed in suitable storage or disposed of in accordance with the manufacturer's instructions.

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 explosives containers must be disposed of by burning or as recommended by the manufacturer.

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21.42 Predrilling requirements

Before drilling begins

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

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

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

21.43 Drilling prohibitions

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.

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.

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21.45 Priming

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

21.46 Carrying

Persons must not carry explosive materials in their clothing.

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 explosive accessories takes place.

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) Non-electric shock tubes loaded into holes must not be pulled or snapped.

(2) Shock tube starters must not be fastened to the firing line until all holes are loaded and ready to be blasted.

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.

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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

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

(2) When multiple safety fuses 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) When multiple safety fuse assemblies are to be lit, a suitable lighting device, such as igniter cord, must be used, and once the igniter cord is lit the blast area must be vacated.

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21.58 Stray currents

(1) Precautions must be taken to prevent premature detonation of electric detonators from sources of electricity.

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

21.59 Extraneous currents

Electric detonators must not be used when extraneous current exceeds 50 milliamps.

21.60 Static electricity

(1) Precautions must be taken during handling of electric detonators to prevent premature detonation caused by static electricity.

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

21.61 Radio frequency precautions

(1) During electrical blasting, 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, 1988* as amended from time to time, must be maintained.

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

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

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

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 electrical circuits are being connected, traffic control persons must be posted to instruct vehicle operators to turn transmitters off.

21.63 Testing circuits

Each electrical circuit must be tested before firing using an instrument acceptable to the Board, and the measured resistance must be recorded in the blasting log.

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.]

* See also sections 4.1, 4.3, and 4.11 of the OHS Regulation.

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.

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Firing

21.66 Blaster's responsibility

(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 workers 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.

21.67 Firing lines

The firing lines must not be attached to the blasting machine or blasting circuit until all charges are placed, connected and ready to be fired.

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 inspected 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 blasting area.

(2) Subsection (1) does not apply to avalanche control, single underground headings, buried seismic work in isolated locations or other circumstances deemed appropriate by the Board, in which case the

(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.

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.

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21.71 After the blast

After a blast is detonated, the blaster must not allow any other worker to enter the blasting area until

(a) the area has been examined by the blaster for misfires and other hazards,

(b) the "all clear" has been sounded, and

(c) the blaster gives permission for work to proceed.

21.72 Electrical blasting

After a blast is electrically detonated the blaster must not enter the blasting area until

(a) the blaster has disconnected the firing cables from the blasting machine and has short circuited the lead wires, or

(b) if the blast was detonated from a power line, the blaster has disconnected the firing lines and locked the switch open.

Note: See section 21.84 for alternate procedures for seismic blasting operations.

21.73 Misfires

(1) When a blast initiated by electrical methods cannot be verified to have completely detonated, or is suspected to have misfired, the blaster must disconnect the firing lines from the blasting machine, and wait at least 10 minutes before permitting anyone to enter the danger area.

(2) When a blast initiated by a safety fuse cannot be verified to have completely detonated, or is suspected to have misfired, the blaster must wait at least 30 minutes after the estimated time of detonation before permitting anyone to enter the danger area.

Misfire Procedures

21.74 Blast site examination

The blaster must make a thorough examination of the blast site after charges have been fired to determine that there are no unexploded charges remaining.

21.75 Unfired explosives

(1) If there is evidence or suspicion of misfired charges or undetonated explosives

(a) all loose unfired explosives must be collected and destroyed in a safe manner, and

(b) the blaster must direct the hand removal of as much broken material as possible before metallic tools or equipment are 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 area.

21.76 Removing loose material

(1) Removal of loose material must be done cautiously, with regard for possible undetonated explosive materials or misfired holes.

(2) Loose rock must be scaled from faces in the work area and the area stabilized before other work resumes.

21.77 Marking and detonating

(1) Each misfired charge must be clearly marked and the area cordoned off.

(2) No attempt must be made to remove an unexploded charge and no other work may take place within the blasting area, until the misfired charge has been successfully detonated by rewiring or repriming with a fresh primer.

21.78 Safety fuse reblast

If a misfired charge contains a safety fuse and is reblasted, workers must not return to the blast site until 30 minutes after the detonation.

21.79 No relighting

Relighting a safety fuse is prohibited.

21.80 Drilling for refiring

When drilling is necessary to expose a misfired charge the blaster must

(a) accurately determine the angle of the misfired hole,

(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 misfired charge.

21.81 Extracting explosives

(1) It is prohibited to extract, or attempt to extract, a primer or explosive of the nitroglycerine type from a loaded hole.

(2) Only if the hole does not contain a detonator may a blaster or person authorized by the blaster remove ammonium nitrate, water gel or emulsion type explosives from a blast hole, and the removal procedure must be carried out with caution, using moderate air or water pressure or a combination thereof, with a blowpipe made of non-metallic construction.

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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 explosive materials 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.

(4) Underwater blasts must not be detonated when a diving operation or water craft is within the danger area, nor until the diving supervisor has given permission for the blaster to fire the charge.

(5) After detonating an underwater blast, the site must be examined by the blaster, or by a competent diver who

(a) has been instructed in the recognition of undetonated explosive materials and other blasting related

hazards, and

(b) is under the direction of a blaster.

(6) The blaster must ensure that misfires are handled properly and that other blasting related hazards are removed.

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 together, 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) In seismic blasting, if the recorder can confirm complete detonation, the firing line may be left connected to the firing switch and disconnected at the hole.

(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.

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

(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.]

* See sections 21.22 and 21.23 of the OHS Regulation.

(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.

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) Explosive 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.

(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.]

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22.1 Definitions

In this Part

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

"caisson" means a casing sunk or constructed below ground or water level;

"cut" means the series of loaded and unloaded holes that are drilled in a face to serve as the location for initiating a blast;

"dump" or *"tip"* means an accumulation of rock fragments or other unconsolidated material formed by pushing or dropping the loose material over the crest and allowing it to come to rest without further handling;

"face" means any part of an underground working where excavating is in progress or was last done;

"gassy underground working" means any underground working in which there exists, or is likely to exist, an atmosphere containing more than 10% of the lower explosive limit (LEL) of naturally-occurring flammable gases or vapours, or any other gas or vapour emanating from the ground surrounding the working in concentrations exceeding the exposure limits listed in this Regulation;

"percussion drill" means an air or hydraulic-driven drill that breaks by impact;

"portable switch" means a movable track resting on top of a regular track upon which a train car may be diverted for passing;

"probe hole" means a borehole drilled ahead of or at an angle to the heading being worked to probe for conditions that lie ahead or around the underground working;

"qualified person" means a person who is

(a) qualified because of knowledge, training and experience to design, organize, supervise and perform the duties for which the person is appointed,

(b) familiar with the requirements that apply to the duties for which the person is appointed, and

(c) capable of identifying any potential or actual danger to health or safety in the workplace;

"raise climber" means a mechanical powered work platform, temporary or permanent, controlled from the cage underneath the platform, used to provide access to the face of a raise or other working area;

"underground working" includes any adit, tunnel, underground excavation, chamber, caisson, raise, shaft, winze or natural entry.

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22.2 Application

(1) This Part applies to any underground working which is not a mine within the meaning of the *Mines Act*, or the *Health, Safety and Reclamation Code for Mines in British Columbia,* and which a worker will be required or permitted to enter.

(2) Generally, this Part does not apply to horizontal underground workings that are less than 5 m (16 ft) in length or to permanent facilities in their final structural condition as certified by a professional engineer.

22.3 Work methods

In any underground working, work methods and operations must be in accordance with

(a) standard engineering practices for the type of work being performed,

(b) the requirements of this Part, and all other applicable requirements of this Regulation, and

(c) any additional requirements prescribed by the Board

22.4 New or unusual situations

(1) If an employer proposes to use methods or equipment which are new or not in accordance with standard practices for underground workings, the employer must, before starting work, submit details of the proposed methods and equipment to the Board for review and acceptance.

(2) A description of the means to ensure the health and safety of workers by engineering or other methods must be part of the submission.

22.5 Preconstruction meeting

(1) Before commencing an underground working, the owner, or if the owner engages another person to be the prime contractor, then that person, must meet with designated officers to review the requirements of this Regulation and other information pertinent to the underground working.

(2) If more than one prime contractor is employed on the project, the owner must attend the pre-construction meeting.

22.6 Notice of project

(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.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

22.7 Underground record

(1) The employer must ensure that a daily log titled "The Underground Record" is provided and that appropriate information is recorded in it.

(2) Required entries in the Underground Record include

(a) daily atmospheric tests with the date, time and location, concentrations of contaminants, and any unusual finding and action taken,

(b) communication system examinations and any action taken,

(c) ground control examinations and any action taken,

(d) any incident required to be reported by Part 3 of the *Workers Compensation Act* or by this Regulation, and

(e) records of

(i) rescue proficiency drills,

(ii) maintenance of self-contained breathing apparatus,

(iii) ventilation test results, and

(iv) calibration and maintenance of testing equipment.

(3) Each record must be clear as to who made the entry, and signed by the worker making the entry as a

true record of the conditions found.

(4) The Underground Record must be read and countersigned by the corresponding supervisor on the oncoming shift, and any unusual or hazardous conditions must be discussed with the workers coming on shift before they are permitted to work in the areas indicated in the record.

(5) The employer must ensure that the Underground Record is

(a) kept at the jobsite for the duration of the project,

(b) available for inspection by an officer, and

(c) retained for 5 years after completion of the project.

22.8 Hours of work

(1) The employer must not permit the employment of a worker in an underground working for a period longer than 8 hours in any 24 hours.

(2) Subsection (1) does not apply when

(a) there are emergencies where life or property is in danger, or

(b) urgent work is essential to the continuation of the ordinary operation of an underground working, provided it is only on an infrequent basis, or to accommodate shift changes within a 24 hour period, provided there is an 8 hour rest period between shifts.

(3) Work performed pursuant to the exceptions in subsection (2) must not exceed 16 hours in any 24 hour period.

(4) If it is impractical to restrict routine underground work to a maximum of 8 hours, the employer must submit written procedures to the Board, as part of the notice of project, and must obtain prior written permission from the Board to work longer hours.

22.9 Additional first aid

In addition to the requirements of sections 3.14 to 3.21, if an underground working has progressed more than 300 m (1,000 ft) underground, a first aid attendant must be available in proximity to the main underground work area.

[Amended by B.C. Reg. 348/2003, effective March 30, 2004.]

22.10 Retroreflective devices

Underground workers must wear retroreflective devices on their clothing and hard hats.

22.11 Self-rescuers

(1) For non-gassy workings, a minimum of an approved self-rescuer of the air purifying type must be carried by the worker

(2) For gassy workings, a minimum of a self-contained (air supply) self-rescuer capable of delivering 30 minutes of air must be immediately accessible to each worker underground.

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22.12 Underground supervisors

(1) The employer must ensure that every worker involved in the active excavation or rehabilitation of an underground working is under the direct supervision of the holder of an underground excavation supervisor certificate acceptable to the Board.

(2) Workers not involved in the active excavation or rehabilitation of an underground working must be under the direction of a supervisor who holds an underground supervisor certificate.

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

* See also section 117, the *Workers Compensation Act*.

22.13 Underground worker health and safety representative

(1) In every underground working there must be a qualified underground worker safety representative on each shift who is regularly employed at the site, and is

(a) chosen by the workers, and

(b) experienced in the work being performed and is familiar with the applicable health and safety requirements.

(2) The worker representative has the right, if there is reasonable cause to believe that a hazardous condition exists, to ask for and attend the investigation of the condition, and verify that any necessary corrective actions have been taken.

(3) The worker representatives must have their names posted in a conspicuous location at the worksite.

22.14 Impaired persons

(1) If in the opinion of the supervisor a person's ability is so impaired as to endanger the person's own health and safety or the health and safety of any worker, this person may not enter, remain, or be permitted to enter or remain in any underground working.

(2) No intoxicating liquor or illegal drugs are permitted in or about an underground working.

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22.15 Responsibility for ventilation

If an underground working involves the services of one or more subcontractors or their workers, the person engaged by the owner to be the prime contractor, or, if there is no one such person, then the owner, must ensure that the air in all parts of the underground working, where workers may work or travel, is free from injurious or dangerous concentrations of contaminants and contains sufficient oxygen to prevent danger to the health of anyone in the underground working.

22.16 Prior approval

(1) The design for an underground working ventilation system must have the prior written approval of the Board before installation commences.

(2) The design submitted to the Board must include

(a) the dimensions of the underground working,

(b) a list of the equipment proposed for use underground and the air flow necessary for each internal combustion engine,

(c) calculations of the system air flow requirements and pressures to be developed in the system,

(d) ductwork dimensions and specifications,

(e) the make, model, horsepower, blade settings and performance curves or tables for all fans,

(f) detailed drawings of any other devices to be installed in the ventilation system,

(g) a cross section of the portal, showing the main exhaust located so that exhausted air will not come back to the portal,

(h) the altitude of the portal,

(i) a statement of air contaminant sources expected and proposed testing points and frequency of tests, and

(j) a schedule of hours of work.

22.17 Qualified person

At every underground working, the employer must appoint a qualified person on site to be responsible

for all aspects of ventilation in the underground working.

22.18 Mechanical ventilation

(1) The employer must ensure that every underground working has a mechanical ventilation system that is

(a) designed, installed, and operated in accordance with good engineering practice,

(b) maintained in good working order, and

(c) capable of supplying sufficient fresh air to the underground working.

(2) The exhaust from compressed air machines must not be considered as ventilation.

22.19 Air flow

The main ventilation system must be capable of operating on blowing or exhaust duty and be equipped with a reversing switch, which normally will operate on exhaust, and the air flow must be

(a) at least 15 cubic metres per minute for each square metre (50 cfm for each square foot) of the working face area, and

(b) where internal combustion engines are used underground, the total of the air flows specified on the engine permits.

22.20 Portal fan

The portal fan may be operated on blowing duty for an initial tunnel advance not exceeding 300 m (1 000 ft).

22.21 Auxiliary fan

The work face must be ventilated by means of an auxiliary fan system which

(a) has an air flow of at least 15 cubic metres per minute for each square metre (50 cfm for each square foot) of the working face area, but not more than 90% of the main exhaust system flow,

(b) has its inlet overlapping the inlet of the main exhaust system by at least 30 m (100 ft),

(c) discharges from within 18 m (60 ft) of the face, unless workers are absent from the face, and

(d) has an effective silencer if required by the Board.

22.22 Modifications

If any modifications are made to the ventilation system, the employer must inform the Board immediately.

22.23 Malfunction

If the ventilation system ceases to function, all contaminant producing work must stop immediately, and all engines must be shut down until ventilation is restored.

22.24 Unventilated areas

Any underground area that is not ventilated must be effectively secured to prevent the entry of workers and posted with signs to warn of the hazard.

22.25 Duct air testing

(1) Duct air velocities must be measured at least once a week and any deficiencies must be corrected.

(2) Testing must take place

(a) within 9 m (30 ft) of the main duct inlet and any branch inlets,

(b) at the auxiliary fan duct outlet,

(c) 6 m to 15 m (20 ft to 50 ft) from the portal fan, and

(d) at any other location or interval as directed by an officer.

(3) The results and observations of all testing and any corrective action taken must be recorded in the Underground Record.

22.26 Welding fumes

Fumes from welding activities underground must be controlled at the source by local exhaust ventilation.

22.27 Heating underground air

(1) Before a heating system is installed or used in an underground working, the design, specifications, and operating procedure must be submitted to the Board for approval.

(2) The heating device must be

(a) located at least 25 m (80 ft) outside an entrance to an underground working,

(b) vented to prevent flue gases from entering the underground working,

(c) equipped with an automatic fuel shutoff if the fire goes out, and

(d) manually restarted after an automatic shutdown.

22.28 Heating equipment

(1) The installation of underground heating equipment acceptable to the Board must include provisions

for mounting, clearances and air supply, and must meet the applicable requirements of the following standards and codes as amended from time to time:

(a) *CSA Standard CAN/CSA-B139-M91, Installation Code for Oil Burning Equipment*;

(b) *CGA Code CAN/CGA-B149.1-M91, Natural Gas Installation Code*;

(c) *CGA Code CAN/CGA-B149.2-M91, Propane Installation Code*;

(d) *CSA Standard C22.1-94, Canadian Electrical Code, Part 1*;

(e) *CSA Standard B51-M1991, Boiler, Pressure Vessel, and Pressure Piping Code*.

(2) With the exception of embedded pipes or ducts, all parts of the heating system must be readily accessible for inspection, maintenance, repair, and cleaning.

(3) The heating system must be protected from freezing.

(4) A carbon monoxide detector, capable of detecting concentrations below 25 ppm and shutting down the heater if this level is exceeded, must be installed 15 m (50 ft) downstream from where the heated air enters the underground working.

(5) Pipelines with gas pressures in excess of 3.5 kPa (0.5 psi) must not be located within 15 m (50 ft) of an underground working.

(6) Pressure regulating stations must be clearly marked and protected from physical damage.

(7) Propane storage tanks must be located so that any leak will not enter an underground working.

(8) A vibration switch that will shut down the heater at prescribed vibration limits must be mounted on the fan cage.

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

* See also section 4.4 of the OHS Regulation.

22.29 Other heating devices

The following heating devices must not be located in an underground working or within 25 m (80 ft) of the portal:

(a) an open flame heater;

(b) a liquefied petroleum gas or natural gas heater;

(c) a heater, torch or burner using fuel with a flash point of less than 40°C (104°F).

22.30 Atmospheric testing

(1) The employer must ensure that tests of the underground atmosphere are conducted to ensure that an oxygen deficient atmosphere does not exist, that a worker's exposure to air contaminants does not exceed

the exposure limits in Part 5 (Chemical and Biological Substances), and that a worker's exposure to respirable combustible dust (RCD) does not exceed its exposure limit, which is 1.5 mg/m^3, based on an 8-hour time weighted average.

(2) Tests must be conducted by a qualified person using equipment, devices and methods acceptable to the Board.

(3) Calibrations of testing equipment must be recorded in the Underground Record.

(4) Test results must be recorded and signed in the Underground Record by the qualified person doing the testing, and must be readily available for review by affected workers.

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

* See also sections 4.1 and 4.3 of the OHS Regulation.

22.31 Testing during construction

During construction or excavation of an underground working the employer must ensure that atmospheric tests are made for carbon monoxide, nitrogen dioxide, combustible gases and oxygen content

(a) if the ventilation has been interrupted for more than one hour,

(b) at least every 4 hours while an internal combustion engine is operating,

(c) after blasting has taken place,

(d) after a fire or other unusual occurrence causing atmospheric contamination, or

(e) as directed by an officer.

22.32 Additional tests

(1) If the presence of a flammable or toxic gas is suspected or encountered, the employer must ensure that additional tests are made as required.

(2) When a worker has reasonable cause to believe that a hazardous atmosphere may exist, the worker may request that tests be made to determine the level of contaminants.

(3) The supervisor or employer receiving such a request must forthwith investigate, ensure that appropriate testing is conducted and recorded, and that any unsafe atmospheric condition is rectified.

(4) The employer must ensure that only workers qualified to conduct testing and workers necessary to assist them enter an underground working, until it is declared safe.

22.33 Radioactivity survey

(1) When excavation commences, the employer must ensure that a survey is conducted to determine if

significant levels of ionizing radiation are present at the underground working.

(2) If results of the survey indicate that significant levels of ionizing radiation are present, the employer must establish a radiation protection program.

(3) If the initial survey does not indicate the presence of significant levels of ionizing radiation, the underground working must be resurveyed every 30 days as the excavation work proceeds.

22.34 Electrical installations

Electrical equipment and wiring in an underground working must meet the requirements of *CSA Standard CAN/CSA-M421-93, Use of Electricity in Mines*.

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

* See also section 4.4 of the OHS Regulation.

22.35 Communications

(1) An effective radio or telephone communication system must be maintained between the surface and underground work areas including refuge and first aid stations and at least every 600 m (2 000 ft).

(2) The communication system must have an independent power supply.

(3) Removal or failure of one communication device must not render the remainder of the communication system inoperative.

22.36 Illumination

(1) The employer must ensure that the minimum illumination measured 1 m (39 in) above the floor or ground level in an underground working is

(a) 22 lux (2 foot candles) in a tunnel, shaft, incline, and haulage way, and

(b) 54 lux (5 foot candles) at a working face or other area of high activity.

(2) The employer must ensure that an emergency lighting system or apparatus is available for every worker in an underground working so that they may exit safely.

(3) Broken or defective lights must be replaced without delay.

(4) A lower level of illumination, such as provided by an electric cap lamp, may be accepted for underground repair or inspection work of short duration.

22.37 Cap lamps

(1) Cap lamps must be kept in the worker's possession at all times while underground.

(2) All newly purchased cap lamps, and after January 1, 1999 all cap lamps, must be capable of providing

throughout the work shift.

22.38 Maintenance

The employer must establish a procedure for assessing and maintaining cap lamps or equivalent portable lighting system.

22.39 Auxiliary lighting

If a worker is required to assess ground conditions in an underground working, at a distance greater than the effective range of a cap lamp, auxiliary lighting must be provided to safely carry out the assessment.

22.40 Battery charging stations

The employer must ensure that battery charging stations are

(a) effectively ventilated, and

(b) posted with "No Smoking" and "Fire Hazard" signs.

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

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

22.41 Pipelines

The employer must ensure that air, water or discharge pipelines are

(a) hung or secured from suitable hangers, and

(b) located so that they are protected from moving equipment.

22.42 Water control

(1) If the accumulation of water might affect the stability of the working or otherwise endanger workers, the employer must ensure that a suitable system is installed to remove the water.

(2) Adequate drainage must be installed on all roadways and haulage ways.

22.43 Dams

If there may be a danger to workers from structures for storing water in an underground working, the plans and specifications must be submitted to the Board for approval before construction begins.

22.44 Transportation of workers

The employer must ensure that

(a) workers are not transported in the box of a haulage, pickup or service truck, or in the bucket of a piece of mobile equipment, unless it is specifically designed for that purpose,

(b) workers do not board or leave any vehicle while it is in motion, and

(c) when transporting workers, underground crew vehicles are clearly identified for that purpose.

22.45 Transportation of workers by rail

(1) The employer must ensure that any railway type conveyance used to transport workers is

(a) pulled when transporting workers,

(b) provided with overhead and side protection, and

(c) equipped with handrails, a non-slip floor, and an emergency exit if the conveyance is fully enclosed.

(2) A minimum clearance of 30 cm (1 ft) must be maintained between the head of a worker travelling on the track haulage vehicle and the roof of the roadway or any obstruction.

(3) Prior written acceptance of the Board must be obtained before transporting workers on an incline or slope in an underground working by means of track haulage.

(4) Workers must not ride on the exterior of a car, locomotive or train in an underground working.

(5) Passenger cars hauled by mechanical means must have

(a) a clearance of not less than 15 cm (6 in) above the roof of the car, and

(b) safety chains connected between the cars and between the first car and the locomotive, in addition to the normal couplings or drawbar.

22.46 Shaft conveyances

(1) Workers may only ride in an appropriate, designated shaft conveyance.

(2) When shaft sinking, workers must not ride on the rim of the bucket, or on material or equipment in the bucket.

(3) Suitable safety staging must be installed for transporting workers in buckets over 107 cm (42 in) deep, at a level not less than 107 cm (42 in) below the rim.

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22.47 Procedures

The employer must ensure that

(a) appropriate written emergency procedures are established and are readily available at the worksite, and address

(i) communication and emergency warning procedures,

(ii) evacuation and personnel count procedures,

(iii) fire fighting and rescue procedures,

(iv) ventilation procedures,

(v) location of emergency equipment and procedures for use, and

(vi) other relevant information,

(b) notices giving direction for immediate action in an emergency are posted in conspicuous places,

(c) each person is instructed in the emergency procedures before commencing work in an underground working, and

(d) a designated worker on each shift is responsible for implementing the emergency procedures.

22.48 Coordination

The employer must designate an emergency response coordinator with full authority to implement the emergency procedures.

22.49 Evacuation procedure

A test of the evacuation procedure must be done within 3 months of commencing the project, and at least annually thereafter.

22.50 Refuge stations

(1) A refuge station must be provided within 500 m (1 640 ft) of the main underground work area, which is

(a) large enough to accommodate all workers underground,

(b) supplied with drinking water and compressed air tanks or cylinders,

(c) equipped with a communication system to the surface,

(d) capable of being sealed to prevent the entry of gases,

(e) provided with a plan of the underground working which shows all exits,

(f) maintained in sanitary condition, and

(g) equipped with emergency lighting.

(2) When unusual conditions warrant, such as gassy underground workings, additional refuge stations may be required by the Board.

22.51 Rescue workers

(1) The employer must ensure that workers holding certificates of competence in underground mine rescue valid in BC, or other similar certification acceptable to the Board, who are trained in and capable of carrying out the established emergency procedures, are available for rescue operations as follows:

(a) at least 3 workers when 6 to 10 workers are underground on shift;

(b) at least 5 workers when more than 10 workers are underground on shift;

(c) if 5 or fewer workers per shift are employed underground, or if the underground workings do not progress more than 300 m (1 000 ft), the employer must submit written rescue procedures, including details of training and availability of rescue workers, for Board approval.

(2) The names and locations of trained workers must be posted in conspicuous places.

(3) The employer must ensure that proficiency drills for workers trained in rescue work are held at least every 30 days, and are recorded in the Underground Record.

22.52 Self-contained breathing apparatus

(1) The employer must ensure that self-contained breathing apparatus (SCBA) for use in emergencies is available and located on the surface as near to the portal as is practicable, and capable of at least 2 hours operation.

(2) The employer must provide

(a) at least 4 units of SCBA when 10 or fewer workers are underground on shift, and

(b) at least 6 units of SCBA when more than 10 workers are underground on shift.

22.53 Dangerous conditions

(1) Only workers trained for emergencies may enter or remain in any underground working dangerous to life or health by virtue of fire, unplanned explosion, hazardous atmosphere or other hazardous condition, and no other work may be performed until the hazardous condition has been eliminated or controlled.

(2) Hazardous conditions described in subsection (1) must be reported to the Board.

22.54 Fire prevention and control

The employer must ensure that

(a) sufficient suitable fire extinguishers or other systems of fire control are available at any underground location where a fire may occur, and that automatic systems are installed in shops and lunch rooms,

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

(c) oil, grease and flammable liquids with a flash point below 52°C (126°F) used in an underground working are transported and stored only in metal containers or receptacles or in portable plastic containers approved for petroleum fuels, and when stored underground, unless in an approved enclosure, are restricted to a quantity sufficient for the current day's work,

(d) any equipment repair or refueling depot is not located underground unless written permission has been obtained from the Board, and

(e) workers do not build, start, or maintain a fire in an underground working.

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

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

22.55 Flammable gas restriction

(1) Except when needed for burning or cutting, acetylene, propane, or other volatile fuel must not be permitted underground.

(2) If volatile fuels are used for burning or cutting, the containers for the fuel must meet the requirements of the *Transportation of Dangerous Goods Act, 1992* (Canada), and may not have a capacity greater than 10 kg (22 lbs).

22.56 Equipment fire extinguishers

The employer must ensure that mobile diesel equipment used in an underground working is equipped with a fire extinguisher acceptable to the Board.

22.57 Accounting for workers

The employer must ensure that

(a) an effective tag-in method of accounting for all workers entering and leaving the underground working is established and maintained,

(b) at least one worker is on outside duty whenever any worker is underground,

(c) an effective system of checking on any worker is instituted, and

(d) trained rescue workers are identified by distinctive tags.

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22.58 General requirement

The employer must ensure that any portal or collar excavation, including the slopes surrounding it, is effectively stabilized to prevent falls of material into the work area, or other effective means are employed to prevent injury to workers due to falls of material.

22.59 Structures at the entrance

Prior written acceptance must be obtained from the Board before locating any structure built of combustible material, or any hazardous material storage, within 25 m (80 ft) of an entrance to an underground working.

22.60 Projecting support system

Any support system projecting outside an underground working must be of sufficient strength to ensure that it does not break or collapse should material fall from above.

22.61 Spill control

Storage facilities for hazardous liquids must be located so that spillage will not flow towards an underground working.

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22.62 General requirement

The employer must ensure that any part of the underground working accessible to workers is effectively scaled and stabilized, or secured to prevent entry by unauthorized persons, and is periodically inspected by a qualified person to prevent the development of unsafe conditions.

22.63 During excavation

(1) The employer must ensure that any active underground working is examined and, if necessary, scaled daily or otherwise stabilized as the nature of the ground and the work being performed necessitates.

(2) The [illegible]

supervisor of any unusual condition found which has not been corrected.

(3) Any ground stabilization must be done by, or under the direction of a qualified person.

(4) An adequate supply of properly sized and dressed scaling bars and other equipment necessary for scaling must be provided and maintained by the employer.

(5) If a shoring set is required

(a) any loose rock or material must be scaled or adequately supported before other work is performed,

(b) the set must be designed and installed so that the bottom section is securely anchored to prevent movement,

(c) effective lateral bracing must be installed between sets to stabilize the support,

(d) the set must be completely in place and secured before other work is performed, and

(e) a damaged set that is hazardous must be repaired or replaced without delay.

22.64 Shotcrete

(1) The employer must ensure that shotcrete equipment is maintained in good operating condition, and that all practical measures are taken to control dust at the source during shotcreting operations.

(2) Only those workers involved in the shotcrete operation may work downwind of the operation unless sampling shows that contaminants are within exposure limits.

(3) When shotcrete is being applied

(a) the employer must ensure that any worker who may be affected by shotcrete dust is supplied with and uses appropriate personal protective equipment, and

(b) there must be a worker at the shotcrete machine capable of immediately stopping the flow of material, in communication with the nozzle worker.

22.65 Operator protection

Operators of cranes or other mobile equipment engaged in ground control activities must be protected against falling, flying, or intruding objects or material, by means of suitable cabs, screens, grills, shields, deflectors, guards or structures.

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22.66 Probe holes

(1) Whenever there is the possibility of encountering excessive water, gas, or other hazard, probe holes must be drilled deep enough to identify the hazard or at least 2 rounds ahead of the round to be blasted.

(2) All probe results must be recorded in the Underground Record.

22.67 Connecting to existing workings

(1) The employer must ensure that each supervisor is provided with current development plans for the supervisor's assigned area of responsibility which indicate the size, inclination and length of all development openings and drill holes, and points where openings are or will be within 8 m (25 ft) of a breakthrough.

(2) If an active heading is within 8 m (25 ft) of another underground opening or drill hole, the supervisor must, before any round is fired,

(a) make a thorough examination of other underground openings, drill hole collars, or the nearest point of intersection,

(b) ensure that the heading can be safely advanced, and

(c) ensure that access to the nearest point of intersection with the other opening or drill hole is guarded.

(3) If 2 headings are expected to connect and are within 8 m (25 ft) of connecting, all work must cease in one of the headings, and all previously blasted holes must be examined for remnants of explosives.

22.68 Blasting at adjacent sites

When workers are working at adjacent underground work sites, they must agree to mutually acceptable blasting times and procedures.

22.69 Inspection before abandonment

The employer must ensure that an underground working is not abandoned, nor work discontinued, until material broken in the last round has been cleared from the face of the heading, and the face examined for holes or sockets containing explosives.

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22.70 Transport of explosives

(1) The transport of explosives from the magazine or other surface storage place must be arranged so that no undue delay will occur between the time the explosives leave the surface storage and the time they are properly stored or used underground.

(2) Explosives transported in a shaft conveyance must be transported separately from detonators, and not be transported with other materials.

(3) The hoist operator must be notified before explosives are moved on a shaft conveyance.

(4) Safety staging must be rigged inside the sinking bucket at a depth of 107 cm (42 in) from the rim, to ensure safe handling of the explosives.

22.71 Mechanical haulage

(1) When explosives are transported in underground workings by means of tracked or trackless mechanical haulage,

(a) the speed of the vehicle must not at any time exceed 6 km/h (4 mph),

(b) definite arrangements for the right of way of a vehicle carrying explosives must be made before the vehicle is moved,

(c) the explosives must be protected from trolley wires, batteries or other hazards,

(d) the vehicle must have a flashing light and reflective signs conspicuously displaying the word "EXPLOSIVES" not less than 15 cm (6 in) in height, and

(e) the vehicle engine must be shut off while loading or unloading explosives, except when needed to operate a power takeoff.

(2) Detonator products and explosives must be placed in separate, suitable locked containers, or a single container where they are separated by a barrier approved under the *Explosives Act* (Canada).

22.72 Transport by track haulage

(1) If mechanical track haulage is used the locomotive must pull the conveyance carrying explosives as close to the point of use as possible.

(2) When explosives or detonators are being transported by track haulage they must

(a) be transported in a suitable type of conveyance meeting the requirements of the *Explosives Act* (Canada),

(b) be protected from trolley wires, batteries, or other hazards, and

(c) not be carried on the locomotive.

22.73 Underground storage of explosives

(1) Explosives must not be stored underground without the prior approval of the Board.

(2) A magazine or storage container in an underground working must be located in a safe stabilized area where there is no possibility of being struck by a train or mobile equipment, at least 60 m (200 ft) from any shaft, hoist room, portal, refuge station or worker assembly area, transformer vault, or combustible refuse.

(3) The magazine or storage container must meet type 4 or type 6 magazine specifications under the *Explosives Act* (Canada) and be conspicuously marked by a "Danger - Explosives" sign or signs.

22.74 Restriction on ignition sources

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

* See section 21.40 of the OHS Regulation.

(2) Precautions must be taken to ensure that neither heated materials nor electrical equipment come into direct contact with explosives.

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

22.75 Fume class

Explosives used in underground workings must

(a) possess a Fume Class 1 rating as established by the Explosives Branch of the Department of Energy, Mines and Resources (Canada), and

(b) have prior written approval for use from the Board if not of a Fume Class 1 rating.

22.76 Blasting line

The blasting line must

(a) meet the requirements of *CSA Standard CAN/CSA-M421-93, Use of Electricity in Mines*,

(b) be readily identifiable as blasting cable,

(c) be suspended from insulated supports, and

(d) not be located in close proximity to any electrical lighting or power line.

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

* See also section 4.4 of the OHS Regulation.

22.77 Remote initiation

Where a safe means of exit can not be guaranteed, such as in a shaft or raise, a remote means of initiation must be used.

22.78 Water spray

An effective water spray (atomizer) must be activated in every development heading at the time of the blast.

22.79 Return to blasting site

(1) Written procedures for atmospheric testing and return to the blast site must be developed for each underground working.

(2) Workers must be trained in the procedures and copies must be readily available to all workers for reference.

(3) After a blast is detonated, workers must not return to the blast site until

(a) a minimum of 10 minutes has elapsed, and

(b) tests have confirmed that the concentrations of carbon monoxide or nitrogen dioxide do not exceed the exposure limits prescribed in this Regulation, the oxygen level is not less than 19.5%, and the concentrations of flammable substances are under 20% of their lower explosive limit.

(4) Testing must be carried out cautiously by a qualified person, following established safe work procedures which will prevent exposure to levels above exposure limits.

22.80 Work restriction

Before other work can take place in a blasting area,

(a) all hazards must be identified and controlled,

(b) adequate dust suppression controls must be in place before mucking, and

(c) loose material must be scaled, trimmed or otherwise stabilized by the use of equipment, machines, and methods which minimize the danger of injury to workers.

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22.81 Dust control

(1) Mechanical excavating devices, such as tunnel boring machines and road headers, must have an effective dust control and ventilation system which maintains workers' exposure to dust below the applicable exposure limits in this Regulation.

(2) Such systems must be maintained in good working order and must be operational whenever the mechanical excavating device is working.

22.82 Work clearance

Before any work is done in the confined area at the head of a tunnel boring machine, the machine head must be retracted a full piston stroke from the face, if possible.

22.83 Elevated work

Elevated work in connection with mechanical excavating equipment must be carried out using suitable work platforms.

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22.84 Logs

(1) An inspection and maintenance log must be provided and maintained for each unit of mobile equipment used underground.

(2) The operator of any equipment must

(a) examine the equipment before using it,

(b) note any deficiencies in the vehicle log, and

(c) not operate the equipment until repairs have been made by a qualified person, and noted in the log, or a qualified person has provided assurance that it is safe to operate the equipment, and has noted the reason in the log.

(3) If no deficiencies or unsafe conditions are found, this must be noted in the log.

(4) Before operating equipment the operator must read the most recent entries in the log and if an unsafe condition has been recorded but not corrected the equipment must not be used until repairs have been made by a qualified person, or assurance is given that the equipment is not unsafe to operate and the reason noted in the log.

(5) The employer must monitor the log system to ensure that it is effective.

(6) Records must be kept in the log for all unsafe conditions reported and repairs effected to correct them.

(7) Each entry in the log must show the time and date of the entry and the name of the worker who made the entry.

22.85 Internal combustion engines

(1) Only diesel fueled internal combustion engines may be used underground.

(2) Before using a diesel engine underground the employer must first obtain permission from the Board.

(3) Diesel fuel for use underground must meet the requirements of *CGSB Standard CAN/CGSB-3.16-M88 Mining Diesel Fuel*, but flash point restrictions may be relaxed in accordance with the supplier's recommendations for cold weather conditions.

(4) All diesel fueled equipment used underground must be equipped with adequate devices to control exhaust emissions.

(5) If diesel fueled equipment used underground is fitted with an exhaust scrubber it must be of a type acceptable to the Board.

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

* See also section 4.4 of the OHS Regulation.

22.86 Fire suppression

(1) All diesel powered mobile equipment used underground, capable of holding more than 25 litres (5.5 imp gal) of combustible fluids, must be fitted with a multinozzle fire suppression system in accordance with *CSA Standard CAN/CSA-M424.2-M90, Non-Rail-Bound Diesel-Powered Machines for Use in Non-Gassy Underground Mines*, which operates automatically in the event of a fire.

(2) It must be possible to manually activate the fire suppression system by means of easily accessible ground level devices from the operator's station and from each side of the machine, and the activation of the system must cause engine shutdown.

(3) If, in the opinion of the Board, sufficient danger is present, the employer must use fire-resistant fluids in diesel powered equipment.

22.87 Hoses carrying flammable liquid

(1) Hoses and lines ducting flammable or combustible liquid on mobile equipment used underground must be installed in accordance with *CSA Standard CAN/CSA-M424.2-M90, Non-Rail-Bound Diesel-Powered Machines for Use in Non-Gassy Underground Mines*.

(2) Such hoses and lines must be shielded to prevent leaks or spills from contacting hot surfaces or other ignition sources.

22.88 Operating requirements

Any diesel engine being operated in an underground working must

(a) not expose workers to respirable combustible dust (RCD) from the exhaust in excess of 1.5 mg/m^3

(b) not idle unnecessarily.

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

* See section 4.3 of the OHS Regulation.

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

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22.89 Traffic control

(1) The employer must ensure that a written traffic control scheme is developed for the underground working which provides that where a worker or workers are working in proximity to track or mobile equipment, both the workers and the equipment operators are fully aware of each others' presence.

(2) If an equipment operator encounters pedestrian traffic at a location other than a safety station, the operator must stop and only proceed when the pedestrian gives permission to do so.

22.90 Clearance for mechanical haulage

(1) The employer must ensure that a clear space is provided in an underground working for safely passing workers or equipment which provides

(a) for track haulage, at least 60 cm (2 ft) clear space on one side of the tracks, free of tripping and slipping hazards, and

(b) for trackless haulage, at least 2 m (6.5 ft) total clear space, free of tripping and slipping hazards.

(2) If the minimum clear space cannot be maintained, safety stations must be excavated at least every 30 m (100 ft) to provide an avoidance space for workers.

(3) The safety stations must be

(a) clearly identified and marked,

(b) clean and free of obstructions,

(c) cut as close to perpendicular to the haulage way as is practicable,

(d) at least 1 m (39 in) deep, in addition to the clearance from the vehicle to the wall,

(e) at least 2 m (6.5 ft) high and at least 1.5 m (5 ft) wide, and

(f) excavated on the same side of the haulage way if more than one safety station is required.

(4) Safety stations are not required if the traffic control system prevents simultaneous movement of pedestrians and machinery.

22.91 Track haulage and mucking equipment

(1) The employer must ensure that a locomotive is equipped with

(a) a hold-to-run type of control,

(b) properly maintained headlights, front and rear,

(c) an audible warning system, which must be operated whenever the locomotive is about to move, and to warn workers if they may be endangered by movement of the locomotive,

(d) safe seating for the operator,

(e) an effective braking system, with a parking brake,

(f) non-slip material on steps and footboards,

(g) handholds for entering or leaving the operator's station, and

(h) a restraining device or door if there is a hazard to workers of falling.

(2) The employer must ensure that haulage equipment has

(a) a safety chain or other suitable restraining device between all haulage units,

(b) a positive locking device on rocker type cars to prevent accidental dumping, and

(c) a reflector and a suitable beam or flashing light to indicate the rear of the train.

(3) The employer must ensure that any track mucking equipment is provided with an operator's foot stand which is maintained in position and used when the mucking machine is being operated.

22.92 Equipment hazard area

Workers must not pass

(a) between the cars of haulage equipment at any time, or

(b) any haulage equipment that is being loaded during mucking operations unless the loading machine has finished loading the car or stopped mucking, and the operator has given permission to proceed.

22.93 Switching

(1) The employer must establish and workers must follow safe work procedures for switching cars.

(2) Flag switching is prohibited.

22.94 Derailed equipment

The employer must ensure that derailed equipment is rerailed by means of jacks or other mechanical devices designed for this purpose.

22.95 Track haulage operations

(1) The operator of a locomotive must ensure that

(a) the train is pulled rather than pushed, unless impracticable,

(b) nothing is placed on top of the locomotive unless it is adequately secured, does not extend beyond the ends or sides, nor into the cab of the locomotive, and does not obscure the operator's view,

(c) the brake is applied, the operating control is in neutral and the main switch is in the non-operating position if the locomotive is unattended, and

(d) the locomotive is operated from within the operator's position.

(2) If the operator's vision is limited when pushing muck cars or other equipment, the train must not be moved until a signal worker has been stationed in a safe position at the head of the train with an effective means of communication with the operator.

(3) If locomotives are to be operated by an automatic system or by remote control, prior written acceptance must be obtained from the Board.

22.96 Rail tracks and switches

(1) Rail tracks in use must

(a) be maintained in safe condition,

(b) have joints and fish plates installed directly over the ties,

(c) be maintained reasonably level and free of bumps, dips and obstructions, and

(d) have drainage that prevents water from covering the rails.

(2) A rail switch in which a worker's foot may be trapped must have guards at the frog, guard rail, and switch point.

(3) The employer must ensure that

(a) portable switches are covered between the rails, and

(b) switches on the main haulage line are equipped with suitable safety devices and maintained to allow the free flow of haulage equipment.

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22.97 Automated and remote control systems

(1) If trackless loading and hauling equipment is to be operated by an automatic system or by remote control, prior written acceptance must be obtained from the Board.

(2) If operated by an automatic system or remote control, loading and hauling equipment must be designed so that in the event of failure of the control system the equipment will immediately stop.

(3) Every unit of equipment that is automatically or remotely controlled must be controlled independently of any other unit of equipment so there is no interference between one unit and another.

(4) Operators of automatic or remote control equipment must be positioned in a safe area clear of the equipment's range of motion.

22.98 Clearance lights

The employer must ensure that automatic or remote control equipment is fitted with lights which indicate the width of the vehicle.

22.99 Road maintenance

The employer must ensure that haulage roads are free of holes, ruts, excessive water and loose rock, and are maintained in safe operating condition.

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Waste Dumps and Spoil Areas

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22.100 General requirement

(1) The employer must ensure that waste dumps or spoil areas

(a) are provided with a safe means of entry and exit,

(b) are adequately illuminated,

(c) are operated in accordance with written safe work procedures, and

(d) have effective controls to prevent erosion.

(2) A dump or stockpile area must be examined daily by a qualified person who must communicate any dangerous or abnormal conditions to affected workers.

22.101 Dumping procedures

(1) The employer must

(a) appoint only qualified and suitably equipped persons as dump workers,

(b) where material is to be dumped from a vehicle into a bin, raise, shaft or other opening, provide and maintain a barrier capable of preventing a vehicle from inadvertently entering the bin, raise or opening, and

(c) where dumping is not allowed or dangerous, prevent dumping by barricading the entrance sufficiently to prevent access and posting a sign which reads "No Entry for Dumping Purposes".

(2) Operators are prohibited from dumping material from a haulage vehicle

(a) over a bank more than 3 m (10 ft) high, or

(b) within 3 m (10 ft) of the dump berm crest if the bank is more than 3 m (10 ft) high, except when dumping into a bin, raise, or other opening and a dump berm is in place and a dump worker is directing vehicles to the dumping position.

22.102 Reversing when dumping

The driver of a haulage truck must not

(a) where the bank is more than 3 m (10 ft) high and the dumping position is within 3 m of the dump berm crest, move the vehicle backward to the dumping position, nor begin dumping before having received verbal directions or standard visual signals as shown in Figure 22-1,

(b) operate the vehicle in reverse for a distance greater than 4 truck lengths on

(i) a dump, or

(ii) a stockpile, ramp, road, or a ramp or road that is under construction, unless the ramp or road has a positive gradient of more than 5%.

22.103 Dump worker

A qualified and suitably equipped person, who is responsible for directing traffic at a dump point, must inspect the condition of the dump site as required and report any dangerous or abnormal condition to a supervisor so that corrective action can be taken.

22.104 Track waste dump

A track waste dump must be equipped with

on an elevated dump,

(b) a securely anchored stop block at the end of the dump track capable of stopping a fully loaded train, and

(c) a device to prevent haulage cars from overturning or kicking back when dumping.

22.105 Electrical trolley systems

If an electrical trolley system is used in dumping operations

(a) equipment must be arranged to prevent inadvertent contact with energized lines, and

(b) all affected workers must be instructed in appropriate safe work procedures.

Figure 22-1: Standard hand signals for controlling mobile equipment movement

BACKING THE TRUCK UP

Trucks are guided back to desired dumping positions using a large clockwise circular motion of the right arm. Slow down arm motion as truck nears required dumping spot.

SWING TO THE LEFT

Stopping circular motion and putting right arm across the chest will indicate to the truck driver to swing back of truck to the left. When truck has adjusted direction of travel sufficiently to come to the berm with both rear wheels of the truck the same distance away from the berm, continue the standard circular clockwise motion for backing the truck up.

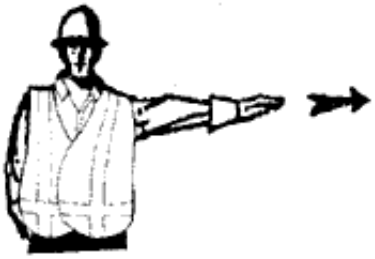
SWING TO THE RIGHT

Stopping circular motion and pointing arm down the berm to the right side of the truck will indicate to the driver to swing the rear of the truck to the right. When truck has made sufficient adjustments to come to a stop with the rear wheels an equal distance from the berm, continue the standard circular clockwise motion for backing the truck up.

RAISE BOX

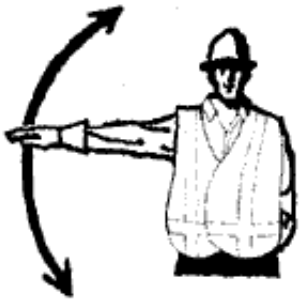
When the truck has stopped, raise the arm pointing upward to indicate to the operator to raise the box and dump.

DRIVE FORWARD



On those occasions when it is necessary to direct the haulage truck to move forward (for example to reposition or move away from a parked position), indicate so by pointing your arm and hand straight out away from the berm or dump, and in the direction of forward travel of the truck.

STOP



When the truck has reached the dump position use a straight upward and downward motion of the arm several times in succession to indicate to the truck driver to stop. This motion must be a full 180° from over the head down to the knee.

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22.106 General requirement

(1) The employer must ensure that

(a) where a timber work platform is used, the main platform bearers are securely pinned to prevent them from dislodging,

(b) ladderways and travelways used for foot traffic are maintained in good repair and clean condition,

(c) a raise in excess of 50° measured from horizontal and 15 m (50 ft) in length has separate compartments for the passage of workers and blasted material during the driving operation and, where

timber is used, that it is installed to within 5 m (16 ft) of the face, and

(d) if an accessway and a skipway occupy the same compartment in a raise, the accessway is not used by workers when the skip is in motion, and a guard is installed between the accessway and skipway to prevent workers from falling into the skipway.

(2) The requirements of subsection (1) do not apply to a raise using mechanical raise equipment.

22.107 Guarding the bottom of the raise

The employer must ensure that

(a) if work is being performed in a raise, the bottom of the raise is effectively guarded to protect workers from falling objects, by a barrier and sign reading "Danger Workers Working Above",

(b) the top end of pilot holes are effectively guarded, and

(c) if a raise is within 2 rounds of breaking through to surface or another work area, a worker is guarding the area of breakthrough.

22.108 Explosives

The employer must ensure that explosives are not taken up the raise until all holes are drilled and are ready for loading.

22.109 Suspended drill platforms

The employer must ensure that a suspended drill platform

(a) complies with the requirements in Part 13 (Ladders, Scaffolds and Temporary Work Platforms) for suspended work platforms,

(b) is stabilized to prevent lateral sway or spinning while in the work position,

(c) is provided with a protective canopy that fully covers the work platform during the first access following a blast, and provides protection for workers if a section is left open for work purposes,

(d) has an effective means of two-way communication between the hoist operator and the work platform, and the communication line is protected from damage,

(e) is provided with a safe means of emergency escape, and

(f) is examined at the beginning of each shift, and has any defects corrected before use.

22.110 Raise climbers

(1) Before a raise climber is installed, the Board must be notified and, if required, the employer must submit the design drawings and technical details of the installation, including construction materials, rated load capacities, dimensions, operating controls and safety features.

(2) The materials and procedures used in the construction of a raise climber must conform to the requirements of appropriate standards of the CSA or ASTM.

(3) A raise climber must not be put into service unless a certificate is available from the manufacturer, or a professional engineer, attesting that all critical load bearing components of the complete assembly and its accessories have been inspected and non- destructively tested by approved methods.

(4) At least once a year after it has been put into service, or when ordered by the Board, any part of a raise climber installation which if it failed could endanger workers must be non-destructively tested by persons certified in accordance with *CGSB Standard CAN/CGSB-48.9712-95, Qualification and Certification of Non-destructive Testing Personnel* and a copy of the test report must be made available on site for inspection by an officer.

(5) A raise climber that has previously been in use in any place beyond the control of the present employer must not be re-installed until the inspections and tests required by subsection (3) have been carried out.

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

* See also section 4.4 of the OHS Regulation.

22.111 Identification plate

Every raise climber must have a durable and legible identification plate which shows

(a) the manufacturer's name, the date of manufacture, the model number and serial number, and

(b) the maximum allowable speed and maximum allowable load ratings as certified by the manufacturer or a professional engineer.

22.112 General brake requirements

(1) Raise climbers must be equipped with at least 2 separate and independently operated service brakes, each capable of safely stopping and holding the conveyance under all rated conditions of load and speed.

(2) An automatic overspeed brake which is capable of bringing the conveyance to a safe stop under any rated load condition from a predetermined overspeed must be installed.

(3) Each brake or braking system must be capable of being independently tested.

(4) If electromechanical brakes are installed they must be activated immediately should the power supply to the climber be interrupted.

22.113 Electrically powered raise climbers

In electrically powered raise climber must have at least one service brake which automatically applies in the event of an interruption of the power supply to the climber, and in such an event, the service brake must be capable of being

(a) operated manually by workers in the climber to lower it safely under continuous control, and

(b) released manually, provided that another brake is available for workers in the climber to lower it to safety under continuous control.

22.114 Brake components

(1) Raise climber brakes must either be designed to compensate automatically for lining wear, or the means for manual adjustment must be readily accessible.

(2) Brake blocks and linings must be protected from water, oil, grease or other substances which could adversely affect them.

(3) The design of the brake system must ensure that the failure of any one component will still leave sufficient braking capacity to bring the climber to a safe stop.

22.115 Guarding

Every raise climber must have all exposed gearing, chain drives, couplings, or any moving parts which could endanger workers effectively guarded or otherwise protected.

22.116 Controls

(1) All operating controls of a raise climber must be situated in a convenient position to allow for their safe operation.

(2) An emergency switch must be provided in the cab of every electrically operated raise climber that will cut off the power to the drive motors if the main control contact fails to open, or in any other emergency.

22.117 Electric equipment

(1) All electrical equipment, including switches, connectors, wiring and cables must be designed, installed and weatherproofed to ensure the integrity of the electric components under all operating conditions.

(2) An electrically powered raise climber must not be operated at a potential of more than 750 volts, and must be protected by a ground fault system.

(3) The operating controls and electrical panels of an electrically driven raise climber must be capable of being locked out to prevent unauthorized operation.

(4) Every raise climber must be equipped with a suitable fire extinguisher.

22.118 Work platforms

(1) Repealed. [B.C. Reg. 420/2004, effective January 1, 2005.]

(2) Work platforms used during raise driving with a raise climber operating at an inclination greater than

60° from the horizontal must be fitted with substantial covers.

(3) Work platforms must be securely anchored to the raise climber guides or rails when being used by workers.

(4) Before any work is done from a work platform all brakes must be applied and the safety device attached to the guide rail.

22.119 Prohibition

No more than one raise climber conveyance may be installed in a raise unless approved by the Board.

22.120 Safety factor

The static factor of safety of all load carrying components of raise climbers and associated equipment must be no less than 5 under the maximum rated load conditions.

22.121 Bolts

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

* See section 4.3 of the OHS Regulation.

(2) Defective or damaged bolts must not be used and all exposed bolts and other components must be protected against damage from falling rock.

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

22.122 Racks and pinions

(1) Only racks and pinions supplied by the manufacturer or certified by a professional engineer may be used.

(2) All permanent raise climber installations used to transport workers must be fitted with a device to continuously monitor the integrity of the rack ahead of the driving pinions, or with a braking system which operates independently of the rack.

22.123 Modification restriction

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

* See section 4.3 of the OHS Regulation.

22.124 Communication

(1) An effective means of communication must be provided between a raise climber conveyance and the

(2) If intermediate levels or landings are served by the conveyance, the Board may require the installation of a suitable signal system.

22.125 Inspection before use

(1) After a raise climber is installed and before it is put into service, the complete installation must be inspected and tested by authorized workers who have available to them the manufacturer's or professional engineer's manual which details specifications and test procedures.

(2) A complete record of the inspection and tests required by subsection (1) and all other inspections and tests, defects, damage or problems, and repairs or maintenance done must be entered in a raise climber log, which must be maintained at the site, and made available for inspection by an officer.

(3) All entries in the log must be dated and signed by the person who carried out the work, and the supervisor in charge of the installation must check and countersign the entries at least once each week.

22.126 Limits and travel stops

(1) Whenever a raise climber is operating, the end of the track on which it travels must be fitted with a stop block to prevent the conveyance from being taken beyond the end of the track.

(2) All permanent electrically driven raise climber installations must be provided with devices which will automatically stop the conveyance at the upper and lower limits of travel.

22.127 Equipment maintenance

(1) The employer must appoint qualified persons to establish mechanical and electrical maintenance schedules for each raise climber, and to ensure that all maintenance is carried out in accordance with the manufacturer's recommendations and the requirements of this Regulation.

(2) A mechanic must check an operating raise climber each day to ensure that it is operating safely.

(3) At least once a week, a mechanic, and for an electrically driven raise climber, an electrician, must perform routine servicing in accordance with the manufacturer's requirements and this Regulation, and inspect and test all safety and protective devices to ensure that they are working properly.

(4) Before recommencing operations after a prolonged shutdown, a full inspection of the complete installation must be made by authorized workers.

22.128 Operator's duties

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

* See section 4.10 of the OHS Regulation.

(2) The operator of a raise climber must ensure that the brakes are in safe working condition at the beginning of the shift, and that the over speed brake is tested at least once a day.

(3) Each day, before normal operations begin, the raise climber must be put through its full range of movements to ensure that all limit switches, brakes, controls, audio and visual indicators are functioning correctly.

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

22.129 Reporting defects

If a worker carrying out a prescribed inspection or test on a raise climber installation finds a defect, fault, malfunction or any other condition which could affect the safe operation of the equipment, the worker must immediately notify the supervisor in charge of the installation, and the raise climber must not be used until remedial action has been taken and the supervisor authorizes a resumption of use.

22.130 Repair requirements

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

* See section 4.3 of the OHS Regulation.

(2) Repairs to a rack or pinion must only be carried out under the direction of a manufacturer's representative or a professional engineer, and the repaired components must be non-destructively tested in accordance with the requirements of section 22.110(4).

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

22.131 Emergency procedures

(1) Means must be readily available to enable workers to descend from a raise climber in the event of a power failure or other emergency.

(2) The employer must ensure that operators of raise climbers and other workers who would be involved in the emergency descent of trapped workers are trained in the use of the emergency equipment.

22.132 Maximum load

The supervisor in charge of a raise climber installation must ensure that the maximum load specified on the identification plate is never exceeded.

22.133 Riding restriction

Except for inspection purposes workers are prohibited from riding on work platforms while they are in motion.

22.134 After blast monitoring

When ascending the raise following a blast, the operator must carefully monitor the condition of the guide rail and rack ahead of the conveyance.

22.135 Transporting material

(1) Equipment or materials being carried in a raise climber conveyance must be properly secured.

(2) Only workers needed for the work to be done may be transported with explosives, steel, timber or similar material or equipment.

(3) Material or equipment must not be dropped down a raise from the conveyance.

22.136 Electrical shut off

The electrical supply to an electrically driven raise climber must be disconnected during preparation for a blast.

22.137 Cleaning

The employer must ensure that a raise climber is thoroughly cleaned at least weekly.

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22.138 General requirement

Excavation of shafts and installation of hoists in an underground working must be in accordance with the applicable regulations from the *Health, Safety and Reclamation Code for Mines in British Columbia* or such other requirements as the Board may prescribe.

22.139 Shaft openings

The employer must ensure that

(a) the collar of a shaft is effectively stabilized, and

(b) the top of a shaft or opening is effectively guarded to prevent workers or material from falling into the shaft.

22.140 Access ways

The employer must ensure that ladder ways, access ways, and platforms are maintained in a safe and clean condition and kept clear of the material hoist system.

22.141 Fixed ladders

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

* See section 4.4 of the OHS Regulation.

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22.142 General requirement

Before a worker is permitted to enter a large diameter hole (LDH)

(a) the hole must be adequately ventilated,

(b) the hole must be tested for oxygen, flammable gases and other airborne contaminants, and

(c) all in-hole electrical equipment must be grounded.

22.143 Vertical holes

The employer must ensure that, before a worker enters a vertical LDH,

(a) the collar of the hole is stabilized,

(b) a casing of adequate strength, extending at least 1 m (39 in) above the surface level, is installed,

(c) the worker entering the hole wears a fall arrest harness attached to a securely anchored lifeline, tended by a worker equipped and capable of rendering immediate assistance, and

(d) there is an effective communication system established between the hoist operator and the worker tending the lifeline.

22.144 Limiting descent

Workers entering large diameter holes must not descend more than 3 m (10 ft) below the casing of the hole unless ground conditions have been inspected and certified safe in writing by a professional engineer, and copies of the certification must be maintained at the worksite.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

22.145 Water in the hole

If water may be encountered in the hole, the bottom of the work platform must be fitted with flotation

devices capable of positively supporting the platform and its load.

22.146 Horizontal holes

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

* See Part 9 (Confined Spaces) of the OHS Regulation.

(2) Workers must not enter a horizontal LDH unless it has a casing of sufficient strength to hold the ground.

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

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22.147 Written notice

If an underground working is classified as gassy a written notice specifying the contaminant gas or vapour must be posted at a conspicuous location on the worksite.

22.148 Worker instruction

Every worker in a gassy underground working must be

(a) informed of the hazardous condition, and

(b) instructed in the necessary precautions for the gassy condition.

22.149 Atmospheric testing

In a gassy underground working additional testing for the naturally occurring gases must be conducted continuously

(a) at all faces, places of work and passageways,

(b) at the equipment operator's station,

(c) in the exhaust duct,

(d) at a probe hole during drilling,

(e) before loading explosives, and

(f) before blasting loaded holes.

22.150 Automatic alarm

Continuous explosive gas monitors must be equipped with automatic alarm systems that are set and maintained to warn workers to evacuate at 20% of the lower explosive limit (LEL), or if the gas monitor malfunctions.

22.151 Ventilation

The main ventilation system must be on an independent electrical circuit and fans must be explosion proof and non-sparking.

22.152 Ventilation malfunction

If the ventilation system malfunctions

(a) every worker must leave the underground working, and

(b) workers must not return until safe ventilation is restored, and the atmosphere tested and declared safe.

22.153 Air velocity

The air velocity in the main air duct must be measured at least once a day.

22.154 No smoking

Workers are not permitted to smoke, or to carry or keep ignition material in an underground working if flammable gas is present.

22.155 Welding and burning

For welding, burning or other spark producing operations, the employer must ensure that

(a) a hot work permit is obtained,

(b) the operations only take place in atmospheres containing less than 20% of the LEL of gases or vapours,

(c) testing for gases or vapours is done before, and continuously during work, and

(d) welding and burning operations are otherwise in compliance with this Regulation.

22.156 Prohibited metals

Objects made of or containing aluminum, magnesium, titanium or light metal alloy are prohibited in a

flammable gassy underground working, except for electrical equipment within a flameproof enclosure, or circumstances where there is no possibility of friction or impact.

22.157 Flame arresters

An internal combustion engine used in a gassy underground working must be equipped with a flame arrester at the exhaust outlet.

22.158 Mechanical excavators

If a mechanical excavator is used

(a) automatic and manual gas monitoring equipment must be provided to test the atmosphere at the working face,

(b) electrical power in the heading must be automatically shut off when 20% of the LEL of a gas or vapour is reached, and

(c) a manual shut off control for the electric power in the heading must be provided at the working area, and the control must be immediately accessible to workers.

22.159 Fire resistant fluids

(1) In a gassy underground working, or in a working containing combustible dusts in sufficient quantity to present a fire or explosion hazard, fire resistant fluids meeting the requirements of *CSA Standard CAN/CSA-M423-M87 Fire Resistant Hydraulic Fluids*, category 1 or 2 must be used in hydraulic systems of more than 10 litre (2.2 imp gal) capacity on equipment in use underground.

(2) Subsection (1) does not apply to

(a) engine hydraulic valve lifters, hydraulic cooling fan drivers, lubricating systems, fuel injection systems, torque converters, transmissions, and axles, or

(b) braking systems employing totally enclosed friction elements immersed in a liquid coolant, and to braking systems with hydraulics independent of any other hydraulic system.

22.160 Combustible dusts

(1) If an underground working or portion of an underground working contains or has the potential to contain coal dust or other combustible dusts in quantities sufficient to present a fire/explosion hazard, the Board may require additional safety measures to be instituted.

(2) Such measures must meet the requirements of the applicable sections of

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

(b) *CSA Standard CAN/CSA-M421-93, Use of Electricity in Mines*, and

(c) *CSA Standard CAN/CSA-M424.1-88, Flameproof Non-Rail-Bound Diesel-Powered Machines for Use*

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

* See also section 4.4 of the OHS Regulation.

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23.1 Definitions

In this Part

"derrick" means a stationary or portable structure used to support the hoisting and lowering mechanism on a rig;

"hot work" means work which involves burning, welding, riveting, grinding, using fire or spark

"lower explosive limit" means the minimum concentration of combustible gas or vapour in air, expressed as a percentage by volume, that will ignite if a source of ignition is present;

"rig" includes a derrick and all equipment that is directly involved with drilling or servicing a well;

"well" means an opening in the ground which

(a) is made or being made by drilling, boring, or in any other manner

(i) for the purpose of obtaining oil, gas or crude bitumen or from which any oil, gas or crude bitumen is obtainable,

(ii) for the purpose of developing or using a reservoir for the storage of natural gas, or

(iii) for the purpose of obtaining geothermal energy,

(b) is made or being made by drilling or boring for the purpose of obtaining water to inject into an underground formation,

(c) is used, drilled or being drilled for the purpose of injecting gas, air, water, or other substance or a form of energy into an underground formation,

(d) is an evaluation well,

(e) is a test hole, or

(f) is drilled or being drilled to a depth of more than 600 m (2 000 ft) to obtain geological or geophysical information.

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

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23.2 Application

23.2 This Part applies to

(a) the exploration for oil, gas, crude bitumen, or geothermal energy,

(b) drilling, operating and servicing a well,

(c) producing, distributing and refining oil, gas, crude bitumen or geothermal energy from a well, and

(d) ancillary processes associated with paragraphs (a) to (c).

23.3 Other legislation

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

23.4 Coordination of multiple employer workplaces

(1) If an activity involves the work of 2 or more employers or their workers, each employer must notify the owner, or the person engaged by the owner to be the prime contractor, in advance of any undertaking likely to create a hazard for a worker of another employer.

(2) If a work location has overlapping or adjoining work activities of 2 or more employers that create a hazard to workers,

(a) the owner, or if the owner engages another person to be the prime contractor, then that person, must

(i) appoint a qualified coordinator for the purpose of ensuring the coordination of health and safety activities for the location, and

(ii) provide up-to-date information as specified in subsection (4) readily available on site, and

(b) each employer must give the coordinator appointed under subsection (2)(a)(i) the name of a qualified person designated to be responsible for that employer's site health and safety activities.

(3) The duties of the qualified coordinator appointed under subsection (2)(a)(i) include

(a) informing employers and workers of the hazards created, and

(b) ensuring that the hazards are addressed throughout the duration of the work activities.

(4) The information required by subsection (2)(a)(ii) includes

(a) the name of the qualified coordinator appointed under subsection (2)(a)(i),

(b) a site drawing, which must be posted, showing project layout, first aid location, emergency transportation provisions, and the evacuation marshalling station, and

(c) a set of work procedures designed to protect the health and safety of workers at the workplace, developed in accordance with the requirements of this Regulation.

Note: The information required by subsection (4) is part of the overall health and safety program required by Part 3 of this Regulation (Rights and Responsibilities). See sections 118 and 119 of Part 3 of the *Workers Compensation Act* for the statutory requirements for coordination of multiple employer workplaces and the general duties of owners.

23.5 Safe work procedures

(1) The employer must identify the work activities or circumstances, including releases of gases, that have caused or may cause significant risk of injury or occupational disease to workers.

(2) The employer must analyze the risks arising out of the work activities or circumstances identified under subsection (1) and implement safe work procedures if the activities or circumstances create a

hazard.

(3) The procedures implemented under subsection (2) must state the number of workers involved, the steps to be followed and the safety equipment required.

23.6 Control of static electricity

(1) When flammable liquids or finely divided materials which may produce a dust which is flammable or explosive are being transferred between containers, the containers must be

(a) in firm contact with each other, and

(b) continuously electrically bonded throughout the transfer to prevent accumulation of a static electric charge.

(2) If tanks, mixers or processing vessels are used for flammable or explosive substances, they must be electrically bonded and grounded while the contents are being transferred.

(3) A well head may be used as a ground

(a) for dissipating static electricity, and

(b) if tested and proved acceptable, for an electrical distribution system.

23.7 Fire hazards

(1) Smoking is prohibited on or about a rig, within 25 m (80 ft) of the well bore and within 25 m (80 ft) of any well, production facility or gas processing plant.

(2) Open flames are prohibited within 25 m (80 ft) of the well bore whenever gas may be emitted from the well or any other source.

(3) If iron sulfide is removed from a tank

(a) the iron sulfide must be kept wetted down until safely disposed of, and

(b) other materials and equipment which are contaminated must be kept wetted down or kept in an inert atmosphere until cleaned.

23.8 Control of ignition sources

(1) If regular monitoring and hotwork permits are not in use to control ignition sources

(a) internal combustion engines must be shut down within the zone defined by the *BC Electrical Code* and the Drilling and Production Regulation as a Class 1 Division 2 or higher classification, unless their operation is integral to the work process, and

(b) diesel engines required to operate within the zone defined by the *BC Electrical Code* and the Drilling and Production Regulation as a Class 1 Division 2 or higher classification must have a positive air shutoff or other effective method for engine shut down.

(2) Mobile equipment powered by a diesel engine and used for maintenance or repair work on pressurized gathering, distribution and transmission equipment must have a positive air shutoff or other effective method of engine shut down.

23.9 Flare pits and flare lines

(1) Written safe work procedures must be implemented to ensure the safety of workers lighting or operating a flare tip, flare stack or flare line.

(2) Workers must be instructed in the application of the written work procedures required by subsection (1).

(3) Before workers enter a flare system danger area where the installation is temporary and remote ignition of the pilot is not feasible

(a) the flare line must be isolated, and

(b) contaminants in the flare pit area must be less than 20% of the lower explosive limit.

(4) The location of a flare pit or stack must not interfere with safe access to the work area.

(5) If feasible, there must be a continuous ignition source before flow to a flare pit or stack occurs.

23.10 Fire extinguishers

(1) Non-freezing fire extinguishers, other firefighting equipment and firefighting personnel must be provided as required by subsections (2), (3) and (4) and Table 23-1.

(2) The minimum requirements for a twin agent unit are

(a) 1 100 litres (250 imp gal) pre-mixed ATC foam solution at 6%,

(b) 680 kg (1 500 lbs) potassium bicarbonate dry chemical system,

(c) 30 m (100 ft) discharge hose, and

(d) two firefighting personnel.

(3) The minimum requirements for a continuous foam unit are

(a) 475 litres (100 imp gal) ATC foam concentrate,

(b) 680 kg (1 500 lbs) potassium bicarbonate dry chemical system,

(c) 1 900 litres (400 imp gal) per minute centrifugal certified fire pump with one 65 mm (2.5 in) discharge port, two 38 mm (1.5 in) discharge ports, and one 125 mm (5 in) suction port, and

(d) two firefighting personnel.

(4) Firefighting equipment must meet the requirements of *NFPA 10, Portable Fire Extinguishers, 1990 Edition*.

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

* See also section 4.4 of the OHS Regulation.

Table 23-1: Minimum requirements for firefighting equipment

Work activity	Number of extinguishers required	Type of extinguisher
Heavy hauler	1	20-BC
Hot oiler	2	20-BC
Seismic shot hole drill	2	20-BC
Drilling rig	4	40-BC
Service rig	4	40-BC
Battery operator	1	20-BC
Fluid hauler	1	40-BC
Service truck of 1 tonne capacity or more	1	20-BC
Any other commercial vehicle	1	5-BC
Any vehicle carrying explosives	2	20-BC
Welder	1	10-BC
Well testing	2	10-BC
1 fracturing tank	1	Twin agent unit
2, 3 or 4 fracturing tanks	1	Continuous foam unit with 100 barrel water truck
5 or more fracturing tanks or greater than 40% methanol water fracturing	The fire hazard must be evaluated in accordance with current industry standards, and firefighting equipment and personnel must be provided as determined necessary by the evaluation.	

23.11 Air operating systems

(1) Alcohol must not be added to air lines at the air intake side of a compressor.

(2) The air in the alcohol injection system must be bled down to atmospheric pressure before opening an air operating system to inject alcohol.

(3) If an air operating system supplies air for breathing purposes, the alcohol injection system must be isolated, the system purged of old air, and air purifying systems placed between existing piping and workers using the breathing system.

(1) Pipelines, piping systems, fittings and valves must

(a) be designed, constructed and maintained to safely withstand the anticipated internal pressures and external loads,

(b) be restrained from undue horizontal, vertical or swinging motion, and

(c) if applicable, meet the requirements of

(i) *CSA Standard Z662-94, Oil and Gas Pipeline Systems,* or

(ii) *API Recommended Practice 520, Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries, Part I — Sizing and Selection (July 1990, 5th Edition)* and *Part II — Installation (November 1988, 3rd Edition),* or

(iii) *API Recommended Practice 521, Guide for Pressure-relieving and Depressuring Systems, dated November, 1990 (3rd edition),* or

(iv) *American Society of Mechanical Engineers (ASME) Standard B31.3-1993, Chemical Plant and Petroleum Refinery Piping*.

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

(2) When a valve is to be disassembled

(a) it must be depressurized, purged or otherwise made safe, and

(b) written safe work procedures must be followed.

(3) Process control and power systems must be designed to operate on the gas being used.

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

23.13 Hose connections

(1) Hoses and fittings must be of a design suitable for the type of service for which they are used.

(2) Quick connect fittings must be identified or have hardware controls to ensure connection only to the correct service.

(3) Quick connect fittings for breathing air service must be different from and not compatible for connection to any other service.

(4) Temporary piping and hose systems for hazardous fluids must be effectively protected from damage.

23.14 Pumps

(1) A positive displacement pump and attachments must have valves, pipes and fittings capable of withstanding the pump's maximum working pressure.

(2) A quick closing type valve must not be used on the discharge line of a positive displacement pump.

(3) A positive displacement pump must be protected against freezing.

(4) Except for a pumping wellhead, a pressure relief device must be installed on the discharge side of a positive displacement pump, but a valve must not be installed between them.

(5) For a wellhead utilizing a down-hole positive displacement pump, the employer must implement measures to prevent the pump from causing pressures that exceed the pressure rating of the system.

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

23.15 Pressure relief device — when required

Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

23.16 Pressure relief device — installation

(1) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.] .

(2) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(3) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(4) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(5) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(6) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

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

(8) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

23.17 Pipe racks

(1) Pipe racks and tubs must be placed on a level and firm surface.

(2) Pipe, tubular goods or similar round material must be prevented from accidentally rolling off a pipe rack.

(3) Spacers must be used between the layers of pipe or other material on a pipe rack.

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

23.18 Handling pipe

(1) Pipes or tubular goods must be restrained from uncontrolled movement.

(2) Deck pins used to restrain pipes must

(a) be at least 45 cm (18 in) high, and extend beyond the centre line of the pipe closest to the pins, or

(b) if the pipe is tiered, extend one pipe diameter above the pipe closest to the pins.

(3) Deck pins are not required if specialized dunnage is used.

(4) Pipes or tubular goods must be adequately secured before restraining devices are removed.

(5) While pipe is being loaded, unloaded or transferred, workers must not be on top of an unsecured load, between the load and the pipe racks or tubs, or in any other area made hazardous by potential pipe movement.

(6) When pipe is being transferred between pipe racks, catwalks, or trucks, temporary supports or skids must be constructed, placed and anchored so that they will support the load placed upon them.

(7) When transferring drill collars, tubular goods or other similar materials which are not provided with shoulders, pick up subs or other appropriate pipe handling equipment must be used.

(8) A nubbin must not be used to pick up drill collars, tubular goods or similar materials unless the nubbin is equipped with a wire rope safety line and swivel for attachment to the elevator bails.

(9) A trailer used as a pipe rack during drilling, servicing or pipe salvaging must have a guard, along the full length of both sides of the trailer, designed and constructed to ensure that when a pipe is hoisted into the derrick, the lower end of the pipe will not roll off the trailer.

(10) Repealed. [B.C. Reg. 258/2008, effective January 1, 2009.]

(11) Pipes must be loaded on or unloaded from a truck one layer at a time.

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

23.19 Kelly hose and safety lines

(1) Clamps and wire rope safety lines or chains must be used to fasten the kelly hose at the standpipe end to the derrick and at the swivel end of the swivel housing.

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

* See section 4.3 of the OHS Regulation.

(3) Shock hoses from pump to standpipe must be restrained by safety lines if they are subject to whipping.

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

23.20 Catheads

The employer must ensure that workers do not use friction catheads after April 14, 1999.

23.21 Rigging up and tearing out

(1) The driver of a vehicle used for rigging up or tearing out equipment must not move the vehicle until

signalled to move by a qualified signaller.

(2) The signaller must ensure that workers are clear of the path of the vehicle, load and load line.

(3) To prevent materials or equipment from rolling or sliding off a truck or trailer during unloading operations, load tie down devices must not be removed until the lifting slings and hoist line have been attached to the equipment or material that may slide or roll off, and slack in the hoist line and rigging has been taken up.

(4) A worker must not remain or ride on a load or part of a load being raised, lowered or moved.

(5) The movement of a load being raised or lowered must be controlled by

(a) a tag line long enough to ensure that the worker controlling it cannot be struck by the load, or

(b) where a helicopter is being used, by effective work procedures.

(6) A worker must not work, stand or pass

(a) under a suspended load,

(b) between the winch mechanisms and a load being winched, or

(c) in areas where the worker may be injured due to winch line or mechanism failure.

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

* See section 4.3 of the OHS Regulation.

(8) Winch mechanisms, lines, slings, hooks and fittings must be inspected thoroughly by the equipment operator

(a) before commencing work, and

(b) at such intervals as the nature of the work may require.

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

23.22 Driver training

A vehicle driver in the oil and gas industry must, before operating a vehicle with a gross vehicle weight rating greater than 5 500 kg (12 000 lbs.),

(a) be certified in the applicable Enform Canada driver training course acceptable to the Board, or

(b) have completed driver training providing skills and knowledge for safe driving equivalent to or better than those required by paragraph (a).

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

23.23 Steep slopes

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

(2) If material or equipment must be moved on steep terrain, a written plan must be prepared before snubbing or yo-yo operations are carried out.

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

23.24 Roads

Roads, bridges and other structures forming part of the road system used by mobile equipment to transport workers, equipment or materials in connection with operations covered by this Part must meet the requirements for roads and road maintenance in Part 26 (Forestry Operations and Similar Activities).

23.25 Transporting liquids

Liquids must be transported in properly designed and constructed tanks or vessels.

23.26 Gauging

A tank which contains or may contain a fluid with hydrogen sulfide as a component must have an external means of gauging its contents, or if manual gauging or sampling is required, the worker doing the gauging or sampling must use a supplied air respirator meeting the requirements of Part 8 (Personal Protective Clothing and Equipment) for use in an IDLH atmosphere, and must be visually monitored by another worker equipped with an equivalent respirator and capable of effecting a rescue of the worker doing the gauging or sampling.

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23.27 Power line and upset hazards

The drill mast must be lowered if equipment is being moved and there is a danger of

(a) the mast contacting power lines or other overhead obstructions, or

(b) the unit losing stability.

23.28 Seismic drills

(1) A seismic drill must have an emergency engine stopping device which is clearly identified, within reach of the drill operator at the drilling position, and tested daily.

23.29 Communications on vehicles

If a worker rides on a seismic line truck to perform work, there must be an effective means of communication between the driver and the worker.

23.30 Breakout tongs

Repealed. [B.C. Reg. 258/2008, effective January 1, 2009.]

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23.31 Size of work area

The owner must ensure that the work area is sized, constructed and laid out so that

(a) all the required equipment may be safely moved and operated, and

(b) emergency response activities may be carried out.

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

* See section 4.2 of the OHS Regulation.

23.32 Inspection and repair

(1) Each drilling and service rig must be inspected and repaired in accordance with the following applicable standards published by the Canadian Association of Oilwell Drilling Contractors:

(a) *Recommended Practice 1.0, for Drilling Rigs, Mast Inspection and Certification, January 1, 1994;*

(b) *Recommended Practice 2.0, for Drilling Rigs, Overhead Equipment Inspection and Certification, January 1, 1994;*

(c) *Recommended Practice 3.0, for Service Rigs, Inspection and Certification of Masts, January 1, 1994;*

(d) *Recommended Practice 4.0, for Service Rigs, Overhead Equipment Inspection and Certification, January 1, 1994;*

(e) *Recommended Practice 1.0A, Addendum for Drilling Rigs, Substructure Inspection and Certification, September 12, 1995.*

(2) Inspections and repairs must be recorded in a Canadian Association of Oilwell Drilling Contractors

(3) The log must be available on site for review by an officer.

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

* See also section 4.4 of the OHS Regulation.

23.33 Rig moves

(1) The raising and lowering of a derrick must be done under the direct supervision of the rig manager or other qualified person.

(2) When hoisting a mast section, rigging must be attached to designated lifting points only.

(3) Lifting points must be clearly marked on each mast section of the derrick.

23.34 List of weights

A master list of the weight of rig components must be kept on site.

23.35 Prohibited work areas

Except for the operator at the controls, workers are prohibited from being on, in or beneath a derrick being raised, lowered or telescoped.

23.36 SCBA

On each drilling and service rig there must be a minimum of 4 self-contained breathing apparatus in good working order, 2 together in each of 2 separate opposite locations, so that 2 apparatus are always accessible regardless of wind direction.

23.37 Blowout preventers

(1) When installing a blowout preventer

(a) the preventer must be effectively restrained while it is being aligned, and

(b) workers are prohibited from being located where they may be injured if the preventer swings or drops.

(2) When removing a blowout preventer, 2 opposing anchor lines must remain in position until

(a) the lifting sling is attached to the preventer,

(b) the slack in the hoisting line and rigging is taken up, and

(c) the draw works brake handle is tied down.

Spudding in must not start until

(a) all guards are in place,

(b) all platforms, stairways and handrails are installed and securely fastened,

(c) the escape line, anchors and safety buggy are installed and inspected, and

(d)all connecting pins are secured against dislodgment.

23.39.1 Emergency escape systems

A drilling or service derrick must have an emergency means of escape from the racking board that complies with section 23.39.2 or 23.39.3.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

23.39.2 Emergency escape system 1

(1) A drilling or service derrick must have a specially rigged and securely anchored line as an emergency means of escape that

(a) provides a ready means of escape from the racking board,

(b) consists of a wire rope not less than 13 mm (1/2 in) diameter,

(c) has a length twice the vertical distance between the ground and the point at which it is attached to the derrick,

(d)is effectively anchored and able to withstand a load of 13.3 kN (3 000 lbs), and

(e) is kept free of obstructions.

(2) Equipment must not be placed, and vehicles must not pass, under the last 15 m (50 ft) of the escape line.

(3) A safety buggy of a design acceptable to the Board must be installed and operated on the escape line.

(4) The safety buggy required under subsection (3) must be

(a) kept at the racking board,

(b) provided with an effective brake and means to prevent the trolley from coming off the escape line, and

(c) inspected by a qualified person at least once a week.

(5) The escape line must be tensioned so that a person seated in the safety buggy will touch the ground at a safe distance from the derrick, not less than 6 m (20 ft) from the ground level anchor.

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

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

23.39.3 Emergency escape system 2

(1) A drilling or service derrick must have an emergency means of escape that

(a) is available for use at the racking board whenever a person is working at that level during drilling or well servicing operations,

(b) is able to simultaneously and safely transport all persons from the racking board level, either individually or as a group, to a location at ground level removed from the source of danger,

(c) shields the persons using the system from any danger coming from the well bore during the descent or separates the persons using the system from such danger during the descent,

(d) has a means to keep the persons using the system from falling out of or off of the emergency means of escape during descent, and

(e) has a means, either automatic or manually controlled, to control the rate of descent to a speed that minimizes the risk of injury to the persons using the system when they near ground level.

(2) The placement of equipment and the movement of vehicles in the area under the emergency means of escape required under subsection (1) must be controlled so as to ensure the emergency means of escape can be safely used.

(3) The emergency means of escape required under subsection (1) must be inspected and tested in accordance with the manufacturer's instructions

(a) each time the derrick is erected, before a person works at the racking board during drilling or well servicing operations, and

(b) at least once each month when the rig is being used for drilling or well servicing operations and a person is working at the racking board.

(4) Each person assigned to work at the racking board during drilling or well servicing operations must

(a) have demonstrated proficiency in the use of the type of emergency escape system installed on the rig, and

(b) participate in drills and receive retraining as necessary to ensure ongoing proficiency in the use of the escape system installed on the rig.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

23.40 Draw works controls

(1) If dual purpose controls are used for automatic catheads, a locking device must be installed to prevent one cathead from being accidentally engaged while the other is operating.

(2) The function of each draw works control must be clearly identified.

(3) If a control may become engaged because of accidental contact with lines or other equipment, the control must be suitably guarded.

23.41 Stabbing boards

(1) A stabbing board must be used by a worker located above the derrick floor during the running of casing or tubing, or well servicing operations.

(2) A wooden stabbing board must

(a) be fitted with expanded metal or wire rope fastened to the underside and along the full length of the board,

(b) have each end of the board secured to the derrick by a wire rope of not less than 13 mm (1/2 in) diameter, or chain of at least equivalent strength, and

(c) be at least 30 cm (12 in) wide.

(3) A metal platform of equal width and strength may be used in place of a wooden stabbing board.

(4) At the stabbing board, a personal fall protection system must be attached to

(a) wire rope with a breaking strength of not less than 40 kN (9 000 lbs) stretched across the derrick at a location approximately 2 m (7 ft) above the stabbing board,

(b) a cross-member of the derrick structure at a point approximately 2 m (7 ft) above the stabbing board, or

(c) a solid support secured across the derrick at a location approximately 2 m (7 ft) above the stabbing board.

23.42 Derrick enclosures

(1) Engine rooms, pump houses, derrick floors and derrickhand platforms must be enclosed to a sufficient height to provide protection against the weather.

(2) When erecting, maintaining or dismantling derrick enclosures

(a) safe work procedures must be implemented, and

(b) where practicable, a safe work platform must be provided.

(3) Workers are prohibited from straddling or climbing onto prefabricated wall panels during erection, maintenance or dismantling of derrick enclosures.

(4) Safe exits must be provided directly to the outside on each of at least 3 sides of the derrick floor enclosure.

(5) The pump house enclosure must have at least 2 doors, opening in different directions to the outside.

(6) Exit doors of a derrick enclosure and the doors of the doghouse must

(a) open outward from the derrick floor, and

(b) not be held closed with a lock or outside latch when workers are employed on the derrick floor.

23.43 Ventilation openings

(1) Before commencing drill stem tests, swabbing, bailing, or displacement with gas or oil

(a) derrick enclosures must be altered to provide openings at least 1.8 m (6 ft) high and 2.4 m (8 ft) wide on opposite sides above, and on 2 sides below, the derrick floor, or

(b) adequate mechanical ventilation or monitoring must be provided.

(2) If it is not practicable to provide openings as specified in subsection (1)(a), several openings must be made providing a total area of at least of 4.5 sq m (50 sq ft) on each side.

(3) If mechanical ventilation is used

(a) it must be installed on the mud tank side,

(b) it must be able to completely change the air in the substructure every 2 minutes, and

(c) at least one opening must be provided in the front of the substructure to allow for adequate inflow of makeup air.

(4) During cold weather, ventilation procedures must not compromise the well control systems.

23.44 Pits and tanks

(1) Any pit or tank used for the circulation of flammable material must be isolated from sources of ignition.

(2) If a pit or tank is enclosed, adequate mechanical ventilation must be provided.

23.45 Ladder platforms

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

(2) A personal fall arrest system meeting the requirements of Part 11 (Fall Protection) may be used in place of a ladder safety system where such ladder system is required by the standard referenced in Part 13 (Ladders, Scaffolds and Temporary Work Platforms).

(3) Ladder platforms must be located as follows:

(a) on a triple-stand derrick, 2 or more between the floor and the derrickhand platform, and one or more between the derrickhand platform and the crown;

(b) on a double-stand derrick, one or more between the floor and the derrickhand platform;

(c) on a single-stand derrick, one platform at the level of the derrickhand platform;

(d) at the crown of each drilling rig.

(4) The platforms required by subsection (3) must, as far as practicable, be equally spaced, but not more than 9 m (30 ft) apart.

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

* See section 4.4 of the OHS Regulation.

[Amended by B.C. Reg. 422/2004, effective January 1, 2005.]

23.46 Derrick floor access stairways

(1) On each drilling and service rig, a stairway must be installed beside the ramp and must extend from the ground to the derrick floor.

(2) The catwalk must be provided with a stairway at the outer end.

23.47 Guardrails

(1) Guardrails installed on the walkways and platforms of mud tanks must have

(a) a horizontal top rail not less than 90 cm (36 in) nor more than 1.1 m (42 in) high, and

(b) posts or uprights spaced not more than 3 m (10 ft) apart.

(2) Guardrails must be installed on

(a) the outer perimeter of all mud tank hinged wing platforms or walkways, and

(b) both sides of walkways located over mud tanks.

(3) Wire rope of not less than 10 mm (3/8 in) diameter, or chain of equivalent strength, may be substituted for guardrails on mud tank walkways if the ropes or chains are rigged and maintained at the required height and kept taut.

(4) Floor openings, elevated walkways and platforms must have toeboards meeting the requirements of Part 4 (General Conditions) if the height exceeds 3 m (10 ft) above grade.

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

* See also section 4.60 of the OHS Regulation.

23.48 Hoisting lines

A minimum of 5 wraps of the hoisting line must be maintained on the drum of the draw works to eliminate strain on the drum line anchorage.

(1) Travelling blocks, hooks, elevators, elevator links and other units of travelling equipment on a rig must be free of projecting bolts, nuts, pins or parts.

(2) If a travelling block is being used on a rig, an upward travel limiting device must be provided to prevent the travelling block from contacting the crown block or structure.

(3) The upward travel limiting device required by subsection (2) must

(a) operate by disengaging the hoisting drum from its power source and applying the hoisting drum brake, and

(b) be tested on each shift.

23.50 Hand guards

A worker must not handle moving hoisting lines, unless using a secured spooling device from a safe location.

23.51 Riding hoisting equipment

(1) A worker must not ride the travelling block hook, or elevators, nor slide down any pipe, kelly hose, cable or rope line.

(2) In an emergency an injured worker may be lowered from the derrick by means of the travelling block or a tugger if the rotary table is stopped, and a qualified worker operates the controls.

(3) If the hoisting equipment to be used under subsection (2) is not rated by the hoist manufacturer for hoisting personnel, training with the equipment must be done without suspending or supporting a person with the load line of the hoisting equipment.

[Amended by B.C. Reg. 258/2008, effective January 1, 2009.]

23.52 Guards

(1) Guards of sufficient strength to contain broken parts must be installed at the draw works and rotary table drives of each rig.

(2) Substantial guards of sufficient height must be installed in front of the hoisting drums on a rig to prevent workers from contacting them.

(3) If headache-posts on a rig rotate, the top and bottom ends must be guarded to contain the post should the shaft fracture.

23.53 Crown blocks

If bumper blocks are attached to the underside of the crown beams on a rig, a safety cable or its equivalent must be

(a) fastened along the full length of the bumper blocks, and

(b) secured at both ends to the derrick.

23.54 Securing fingers

The unsupported ends of derrickhand platform fingers must be connected to the platform frame by wire rope not less than 13 mm (1/2 in) in diameter, or chain of at least equivalent strength.

23.55 Counterweight safety lines

A counterweight above the derrick floor which is not fully enclosed or running in permanent guides must be secured to the derrick frame by a wire rope safety line that is not less than 16 mm (5/8 in) in diameter, and of a length that will prevent the counterweight from coming within 2.4 m (8 ft) of the rig floor.

23.56 Weight indicators

A drilling rig must have a reliable load weight indicator, and if it is hung above the floor it must be secured by a wire rope or chain safety line.

23.57 Brakes

(1) The brakes on the draw works of a drilling rig, and on a service rig used for drilling, must be tested at the beginning of each crew shift, and inspected at weekly intervals.

(2) A rig engaged in drilling operations must be equipped with an automatic feed control.

(3) If a hold down chain is used to secure the draw works brake handle, the chain must be attached to the brake handle in a manner which prevents accidental disengagement of the chain.

(4) Loss of brake pressure due to cooling of the brake drum mechanism must be prevented.

(5) The operator of the draw works must not leave the controls unattended while the hoisting drum is in motion, except when drilling.

23.58 Drill pipes, collars and tubing

(1) Whenever drill pipes, drill collars or tubing are racked in a derrick, provision must be made for the complete drainage of any fluids or gases in the stands.

(2) Before drill pipe, drill collar, tubing or casing is run in a well bore, it must be free from ice plugs or other obstructions.

(3) Except while being moved, drill pipes, collars, tubing, casing and rods racked in a derrick must be secured at the top end by means of tieback ropes or equivalent devices to prevent them from falling out of or across the derrick.

23.59 Mud cans

Whenever a wet joint, or stand of pipe or tubing, is being unscrewed and disconnected above the derrick

floor, a mud can must be used to convey any liquids through a pipe to the mud tank or sump.

23.60 Rotary tongs

Rotary tongs must have

(a) a primary safety device to prevent uncontrolled movement of the tongs, and

(b) a secondary safety device that will activate if the primary device fails.

23.61 Rotary table

(1) If visibility on the rig floor is obscured, workers must not work there while the rotary table is in motion.

(2) Hoses, lines or chains must not be operated or handled near a rotary table while it is in motion.

(3) The rotary table must not be engaged until all workers are clear of the rotary table.

23.62 Fuel storage

Except for fuel in the primary supply tanks of operating equipment, gasoline or other liquid fuel must not be stored within 25 m (80 ft) of a well.

23.63 Guylines

(1) Derrick guylines must be secured to adequate ground anchors.

(2) Derrick guylines and ground anchors must be installed according to the requirements of the manufacturer, a professional engineer, or the *American Petroleum Institute Recommended Practice RP 4G-1992, Maintenance and Use of Drilling and Well Servicing Structures, First Edition, January 1, 1992.*

(3) Permanent ground anchors must be designed and installed so they will be effective all year round.

(4) Temporary ground anchors must be pull tested before initial use and, if they continue to be used, tested annually and whenever they may have been affected by seasonal changes.

(5) The manufacturer's specifications for the correct number of guylines and spacing must be legibly marked on a plate affixed to the derrick, or on a specification sheet posted at the rig.

(6) The principal contractor or owner must ensure that documentation is available on site showing that ground anchors meet the requirements of this Part, and that such documentation is signed by the person responsible for the adequacy of the anchors.

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Drill Stem Testing, Swabbing, Cementing, Well Servicing and Stimulation

23.64 General requirements

(1) Drill stem testing procedures must conform to *Alberta Recommended Practices for Well Testing and Fluid Handling, ARP 4.1 Drill Stem Testing, June, 1993*.

(2) During drill stem testing

(a) motors and engines or other sources of ignition not required for the operation must be shut off, and

(b) motor vehicles must not be permitted within 25 m (80 ft) of the well bore.

(3) The rig manager, testing supervisor, and if required, representatives of other contractors doing work must be present to ensure that

(a) workers are trained to carry out their responsibilities during the test, and

(b) the equipment supplied is in good repair and will function as designed.

(4) If liquids are recovered during drill stem tests

(a) the liquids must be reverse circulated from the drill pipe,

(b) prior to reverse circulating, drill pipe may be pulled from the hole using test plugs on every joint of drill pipe disconnected, until well fluids are encountered at the surface, and

(c) if reverse circulation is not practicable due to a failure of the pump out sub, the drill pipe may continue to be tripped out of the hole with extreme caution, using test plugs and a mud can.

(5) If test fluid recovery is encountered during darkness

(a) the liquids recovered must be reverse circulated, and

(b) if reverse circulation is not practicable due to failure of the pump out sub, additional drill pipe must not be pulled and disconnected until daylight.

(6) Whenever oil, water or gas has been encountered during drill stem testing,

(a) tests for the presence of hydrogen sulfide must be done, and

(b) if hydrogen sulfide is found, the sour fluids encountered must be reverse circulated to a vented tank not less than 50 m (165 ft) from the well, or to a flare pit.

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

* See also section 4.4 of the OHS Regulation.

23.64.1 Snubbing operations

A snubbing operation must be carried out in accordance with recognized industry safe work practices.

[Enacted by B.C. Reg. 258/2008, effective January 1, 2009.]

23.65 Swabbing at night

When swabbing at night

(a) auxiliary lighting providing a minimum illumination of 54 lux (5 fc) measured 50 cm (20 in) above the travelled surface must be provided,

(b) rig lighting which is not explosion proof must be turned off,

(c) the sandline depthometer must be used to supplement the sandline flags,

(d)the sandline flags must be illuminated and acid resistant,

(e) adequately illuminated wind direction indicators must be placed at appropriate locations around the site, and

(f) a wellsite supervisor must remain on site at all times.

23.66 Gauging

A swabbing tank must have an external means of gauging its contents.

23.67 Disposal of fluids

(1) Fluids used in or resulting from swabbing must be piped directly through a degasser to a battery, skid tank, mobile trailer tank or tank truck, located not less than 50 m (165 ft) from the well bore.

(2) If fluids used in or resulting from swabbing are being piped into a tank truck the tank truck engine must be shut off, and the driver must not remain in the truck cab.

23.68 Air intake and exhaust

During well servicing

(a) the air intake and exhaust of the pump motor must be located not less than 6 m (20 ft) from the rig tank while the pump is circulating hydrocarbons, and

(b) the tank truck must be located on the far side of the rig tank from the well bore and at a distance not less than 6 m (20 ft) from the rig tank during loading and unloading.

23.69 Flow Piping

(1) Flow piping systems must be anchored during well testing or stimulation unless there is an effective quality assurance program to ensure integrity of the piping system.

(2) The quality assurance program must include routine inspections, non-destructive testing, pressure testing, identification of piping components, and piping specifications that meet the service application.

(3) If swivel joints or hoses are used in well stimulation and similar operations, the piping system must be secured at the well head and supply vehicle or pumping unit end with wire rope safety lines not less than 11 mm (7/16 in) diameter, or chains of equal strength.

(4) Flowback lines must be anchored and restrained.

(5) If a system of piping and swivel joints with a pressure greater than 2 000 kPa (300 psi) is used in well stimulation and similar operations

(a) the operation must be conducted by remote control,

(b) unauthorized workers must not enter the area between the point of discharge and the well head, and

(c) before starting operations, warning signs must be posted in the area stating "DANGER, NO UNAUTHORIZED WORKERS ALLOWED IN THIS AREA" or other similar language.

(6) Subsections (3) and (5) do not apply to well testing.

(7) In a flow piping system exceeding 3 500 kPa (500 psi),

(a) connections must be welded, flanged or hammer unions, and

(b) if there is only a threaded connection available at the well head, special precautions must be taken.

(8) A piping system must be completely depressurized before leaking connections or fittings are corrected.

(9) Hammering on a pressurized system is not permitted.

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

* See section 4.3 of the OHS Regulation.

(11) If liquid carbon dioxide or other liquified gas is used for well stimulation, the valve controls of the supply unit must be on the side opposite to the pipe supplying the liquified gas.

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

23.70 Piping, hoses and valves

(1) Only metal piping, or flexible hose designed for high pressure service, may be used between a service pump and the well head, and a check valve must be installed at the well head end of the piping.

(2) A bleedoff valve must be installed between the check valve and the well head.

23.71 High risk fluids

If it is necessary to replenish the pumping unit supply with high risk fluids, the filling line from an

auxiliary tank must be piped directly to the suction end of the pump, and not into the pumper truck.

23.72 Pressure testing requirements

(1) Before commencing a service operation, piping, pumps, valves and fittings to be used in the operation must be hydraulically tested to a pressure not less than 10% above the maximum anticipated operating pressure as determined by the well owner.

(2) Before commencing well testing or flowback operation, flow line piping, valves and fittings from the well head to the first pressure control choke must be hydraulically pressure tested to a pressure not less than 10% above the maximum anticipated shut-in pressure as determined by the well owner.

(3) When nitrogen is being used in well stimulation, the piping system may be pressure tested with nitrogen provided that the nitrogen treating line is connected to the main line as close to the well as practicable.

(4) Documentation of the testing must be available on the worksite for inspection by an officer.

(5) Air must be purged from the piping system before pressurizing low flash point hydrocarbons.

23.73 Hot oiling

The vent line used in hot oiling operations must discharge a minimum of 10 m (33 ft) from sources of ignition.

23.74 Bonding and grounding

During drill stem testing, swabbing, cementing, well servicing or stimulation, electrical continuity between items of equipment must be maintained and the entire system must be grounded.

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23.75 Preventing ignition

Unless the system is designed and constructed to prevent flashback, sources of ignition in the flare pit and surrounding areas must be extinguished while a vessel is being completely drained to the flare pit and the pressure in the vessel is 35 kPa (5 psi) or less.

23.76 Blanking of lines

Pipes connecting a vessel to a flare system must be blanked off and hoses disconnected

(a) before work is performed within the vessel, and

(b) during treater refilling operations.

23.77 Retaining walls and diked areas

(1) Retaining walls and diked areas must be provided with safe access.

(2) A worker must not enter a diked area unless

(a) effective measures, including testing, have been taken to protect workers if hydrogen sulfide may be present,

(b) testing for flammable gases and vapours, oxygen deficiency and harmful air contaminants is done if there are leaks or spills that may present a hazard to workers, and

(c) testing for flammable gases and vapours is done before hot work takes place.

(3) Testing must be done for hydrogen sulfide before entry to any diked area where sour fluid is stored.

23.78 Truck loading and unloading

(1) A tank truck must be electrically bonded and grounded when loading and unloading hydrocarbons.

(2) The ground conductor required by subsection (1) must remain effectively attached until all other connections have been removed.

(3) Servicing or maintenance must not be carried out on a tank truck when loading or unloading hydrocarbons except for required greasing of the pump.

(4) Chocks must be used to secure a tank truck while loading and unloading hydrocarbons.

(5) Other vehicles must not be started or shut off within 8 m (25 ft) of a tank truck containing flammable vapourizing liquids while it is being connected or disconnected.

(6) If a tank truck is being loaded through a dome hatch and it is necessary to observe the fluid level

(a) a platform must be provided for the loader,

(b) shutoff controls must be located at the platform,

(c) illumination in accordance with the requirements of Part 4 (General Conditions) must be provided during hours of darkness, and

(d) the loading spout must extend to within 15 cm (6 in) of the bottom of the tank.

23.79 Pressure relief

If a tank truck tank is pressurized as part of the unloading process

(b) the truck must be fitted with a pressure relief valve, regulator, pressure gauge and a mechanism for quickly shutting off supply to the tank, and

(c) controls must be readily accessible to the operator.

23.80 Venting of trucks

Tank trucks or loading facilities must have a system for protecting workers from hydrogen sulfide if it is present.

23.81 Wrenches

(1) Valve wrenches must be constructed to an adequate engineered design.

(2) Snipes or extensions must not be applied to valve or pipe wrenches, except by design.

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23.82 Inerting

The requirement to control ignition sources during inerting operations in Part 9 (Confined Spaces) does not apply to the workplaces covered by this Part.

23.83 Safety harnesses

(1) If it is not practicable for a worker entering a confined space to use a lifeline due to internal piping or other obstructions, the worker must wear a full body harness.

(2) If a lifeline is not used, 2 workers must be equipped with respirators and capable of effecting a rescue if required, and stationed immediately outside the entrance to the confined space.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

23.84 Welding precautions

(1) After a vessel or tank has been cleaned, and before further work is performed,

(a) the vessel or tank must be ventilated and tested for toxic and flammable substances and oxygen deficiency, and

(b) repeat tests must be made while work is in progress, as required by Part 9 (Confined Spaces).

(2) If necessary to ensure the safety of workers, steam or an inert gas must be used to purge flammable substances from tankers, tanks, vessels or piping prior to any cutting or welding operations.

(3) Services must be provided through the top accessway of a tank or vessel or, if this is not practicable, the services must be protected.

(4) Equipment or fire extinguishers must not cause a hazard to workers in the tank or vessel.

23.85 Openings

Primary entry ways and ventilation openings must be effectively secured in the open position before entry into a confined space is allowed.

23.86 Electrical equipment

Electrical equipment used in confined spaces must be supplied with power through an approved ground fault circuit interrupter.

23.87 Oxygen powered resuscitators

Repealed. [B.C. Reg. 348/2003, effective March 30, 2004.]

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23.88 Standards

(1) Gas sample containers must meet the requirements of *CSA Standard CAN/CSA-B339-88 Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods*.

(2) Gas sample containers must be used in accordance with *CSA Standard CAN/CSA-B340-M88, Selection and Use of Cylinders, Spheres, Tubes, and Other Containers for the Transportation of Dangerous Goods, Class 2*.

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

* See also section 4.4 of the OHS Regulation.

23.89 Safe practices

(1) Repealed. [B.C. Reg. 381/2004, effective January 1, 2005.]

(2) Valves must be screwed directly into gas sample containers.

(3) Plugs must be used in the gas sample container valves.

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Diving, Fishing and Other Marine Operations Definitions

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24.1 Definitions

In this Part

"altitude diving" means any dive performed over 300 m (1 000 ft) above sea level;

"atmospheric diving system (ADS)" means a diving system capable of withstanding external pressures

greater than atmospheric pressure, and in which the internal pressure remains at one atmosphere, and includes a one person submarine and a one atmosphere compartment of a diving submersible;

"atmospheric pressure" means pressure at the surface of the water, normally considered to be 101.3 kPa (14.7 psi);

"bailout bottle" means an independent breathing gas supply carried by the diver, of sufficient quantity to return the diver to the surface, bell or emergency supply in the event of a malfunction of the primary breathing gas supply;

"bottom time" means the total elapsed time, rounded to the next whole minute, from the time the diver leaves the surface to the time the diver begins final ascent;

"chamber operator" means a person who has demonstrated capability in operating the controls of a recompression chamber and is knowledgeable and competent in diving tables and the application of treatment tables;

"construction diving" means any diving operation that involves burning, welding, erection, alteration, dismantling, demolition, structural maintenance and inspection, excavating, salvage, boring, blasting, concreting and the installation of any machinery or equipment;

"contaminated environment" means a workplace that contains or may contain chemical, biological or radiological material in sufficient concentration that, should any quantity of it be ingested, absorbed, adsorbed or inhaled, will likely endanger the health or safety of the worker;

"contamination reduction zone" means the area used to dress and undress divers, transfer workers from the exclusion zone, and decontaminate personnel and equipment;

"crewmember" for the purposes of sections 24.69 to 24.143, means any person who is working on a fishing vessel;

"decompression illness" means a dysfunction caused by exposure to a reduction in pressure resulting in the production of bubbles in the body;

"deep diving" means any diving operation to depths greater than 50 m (165 ft);

"dive profile" means a logged schedule of the diver's activities during any diving operation, which includes the time the surface was left, depth, decompression, repetitive dives and other information concerning the diving operations;

"dive site" means any location where a diving operation takes place including a boat, scow, float, raft or platform which is seaworthy, secure, and of sufficient size to safely accommodate all workers and equipment without overcrowding;

"diver's harness" means a harness, fitted with a positive buckling device and an attachment point for a lifeline, that will prevent any strain on the diver's mask, helmet and umbilical, that is worn by the diver and is strong enough to lift the diver from the water in an emergency;

"diver's tender" means a worker who is competent and knowledgeable in the diving apparatus being used, the diving operation in progress, emergency diving procedures and communications between diver and tender;

"diving supervisor" means a person having complete and direct responsibility for the diving operation who is knowledgeable and competent with the diving equipment, the diving operations in progress, emergency diving procedures, diving physics and physiology and medical aspects of diving;

"emergency breathing supply" means the bailout bottle carried by the diver and may include the high pressure breathing medium bottle carried on the diving stage;

"exclusion zone" means the workplace at the surface from which divers are tended during a contaminated diving operation;

"fish" means any species of animal living in water, including its eggs or roe;

"fishing vessel" means any vessel used in catching fish or collecting or transporting fish for landing;

"lifeline" means a rope of 16 mm (5/8 in) diameter, of polypropylene or other synthetic fibre of at least equal strength, which is secured to the diver and to a permanent fixture at the surface;

"live boating" means the support of a surface supplied diver from a vessel under way;

"lock-out submersible (or LOS)" means a self-propelled submersible fitted with a submersible compression chamber from which a diving operation can be carried out and that has a separate one atmosphere chamber from which the submersible is operated;

"master" for the purposes of sections sections 24.69 to 24.143, means the person in overall command of a fishing vessel;

"medical recompression" means treatment of a diver in a compressed air environment, in a recompression chamber, in accordance with established practice or medical direction, to alleviate symptoms resulting from a previous decompression;

"mixed gas" means a mixture of breathable gases other than atmospheric air;

"no decompression limit" means that in accordance with the diving table in use for the depth and duration of the dive, no decompression stop is required;

"owner" for the purposes of sections sections 24.69 to 24.143, means the person who holds legal title to a fishing vessel and also includes a charterer of a fishing vessel;

"recompression chamber" means a system consisting of one or more pressure vessels for human occupancy, with associated utilities, controls and instrumentation, whose purpose is to support diving operations, hyperbaric treatment, dive simulation and/or scientific study and equipment testing;

"reserve breathing supply" means a secondary supply, other than the bailout bottle, of a breathing medium of the appropriate mixture and of sufficient quantity to enable the diver to return safely to the surface with all appropriate decompression stops;

"scuba" means self-contained underwater breathing apparatus;

"stage" means a suspended work platform such as a cage, basket or platform in which 2 divers may be lowered to or raised from an underwater worksite;

"submersible compression chamber (or SCC)" means a chamber that is intended to be submerged and

that is designed to transport a person at atmospheric pressure or divers at pressures greater than atmospheric pressure from the surface to an underwater work site and back and includes the compression chamber of a diving submersible;

"support zone" means the workplace used in support of the diving operations and where the cleaning and/or disposal of diving equipment may take place;

"surface supply diving" means supplying air or a mixture of gases to a diver through a hose from the surface;

"umbilical bundle" means a combination of hoses and cable, including a lifeline or strength member attached in a manner to prevent stress on the diver's hose, which is capable of supplying a breathing mixture or other services as required such as power, heat, cooling, communications and depth (kluge) indicating hose.

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24.2 Ladders

Fixed ladders must be provided at every dock for access to and egress from the water, and must

(a) be spaced at intervals not exceeding 30 m (100 ft),

(b) extend from the top of the dock to at least 1 m (3.3 ft) below the lowest water level,

(c) be maintained free of barnacles and marine growth, and

(d) have their location identified by high visibility paint on the curb or bullrail.

24.3 Lifesaving equipment

(1) Appropriate lifesaving equipment must

(a) be provided and maintained for the rescue of any worker in danger of drowning, and

(b) be positioned at intervals not exceeding 50 m (165 ft) in conspicuous locations as near as practicable to the danger area.

(2) Throwing lines fitted to lifebuoys or similar equipment must be of suitable size and length and made of buoyant material.

(3) For the purposes of this section, lifesaving equipment includes lifebuoys, throwing bags, grapples, boat hooks or other equipment appropriate to the circumstances.

24.4 Curbs, bullrails, guardrails and barriers

(1) A curb or bullrail must be installed along the open sides of each float, dock, wharf, pier and similar other area where mobile equipment might be used.

(2) Each curb and bullrail must be of substantial construction and be at least 25 cm (10 in) high.

(3) Where practicable, guardrails meeting the requirements of Part 4 (General Conditions) must be installed at

(a) dangerous breaks in the continuity of a wharf, dock or pier, and

(b) dangerous corners, edges and other parts of a wharf, dock or pier.

(4) Moveable warning barriers may be used where the use of standard guardrails is impracticable.

(5) Effective warning barriers must be installed across the entrances of barge and ship loading ramps when the ramps are not in use.

24.5 Markings

(1) Where circumstances require, curbs, bullrails, guardrails and barriers must be painted solid yellow, yellow and black stripes or checkers, or yellow against a suitable contrasting background.

(2) Retroreflective paint or patches must be applied to curbs, bullrails, guardrails and barriers where mobile equipment is operated at night.

24.6 Rescue boat

A suitable boat must be provided and kept ready for immediate use when workers are employed in situations where a boat is necessary for rescue or evacuation.

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General Requirements

24.7 Application

Sections 24.7 to 24.68 apply to all persons involved in any occupational diving operation.

24.8 Supervisor's responsibility

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

* See section 117 of the *Workers Compensation Act*.

24.9 Notice of project

(1) The employer must submit a notice of project for diving activity, or notify the Board by telephone, at least 24 hours before commencing a diving operation which involves

(a) construction diving,

(b) engineering inspection diving,

(c) diving in a contaminated environment,

(d) diving under ice, under or between nets, or into other areas of potential entrapment,

(e) exceeding the no-decompression limit, or

(f) the use of mixed gas other than nitrox as a breathing medium.

(2) The notice of project must indicate the date, the location, the diving equipment to be used and the scope of the diving operation.

(3) Before diving commences, a copy of the notice of project must be posted at the worksite, or if notification is provided by telephone, a written summary of that notification that contains the information required by subsection (2) must be posted at the worksite.

(4) If in an emergency it is not practicable to notify the Board prior to the start of a diving operation, the Board must be notified as soon as possible, but no later than 24 hours after the diving operation has begun.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

24.10 Medical certification

(1) The employer must ensure that each diver has current medical certification, from a physician knowledgeable and competent in diving medicine, before commencing diving operations.

(2) A diver's medical certification must be

(a) established prior to entry into any commercial diving activity,

(b) renewed every 2 years up to age 39 and annually from age 40 onwards,

(c) renewed more frequently than required by paragraph (b) if clinically indicated, and

(d) re-evaluated by a physician knowledgeable and competent in diving medicine if the diver is subjected to an event or has a physical condition which may affect the diver's medical status.

(3) A copy of each diver's medical certification must be kept at the dive site.

Note: The Workers' Compensation Board maintains a list of physicians knowledgeable and competent in diving medicine.

24.11 Diver's fitness

(1) A diver must not dive if, in the opinion of the diving supervisor, the diver is incapable of functioning safely underwater.

(2) A diver must be medically re-examined, as required by the diving supervisor, to ensure that the diver is fit to dive.

(3) Divers, standby divers and divers' tenders must not participate in any diving operation if they are physically or emotionally fatigued or if they have consumed drugs or alcohol which would impair their ability to work safely.

24.12 Training

(1) A diver must not dive unless the diver has been thoroughly trained in the theory and use of the diving apparatus that the diver will be using.

(2) The training required by subsection (1) must be provided by a person or agency acceptable to the Board.

(3) All divers, diving supervisors and divers' tenders must be trained in CPR, oxygen (O_2) therapy, and diving accident management.

24.13 Evidence of competency

(1) The employer and diving supervisor must ensure that all divers

(a) meet the minimum requirements of *CSA Standard Z275.4-97 Competency Standard for Diving Operations*, and

(b) are competent to use the diving equipment that will be used in the diving operation.

(2) A certified copy of competency documents for each diver must be available for inspection on site by an officer.

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

* See also section 4.4 of the OHS Regulation.

24.14 Diving logs

(1) Each diver must have, and keep for 2 years after the last entry, a personal log containing a record of all

(a) dives carried out, and

(b) medical recompressions and other exposures to a compressed air/mixed gas environment.

(2) The records in a diver's personal log must be in chronological order and each dive must be verified and initialled by the diving supervisor.

(3) The records for each dive must include

(a) the type of diving apparatus used and the gas medium breathed,

(b) the times the diver left the surface, reached and left the bottom, and returned to the surface,

(c) the maximum depth attained,

(d) the surface interval, if a repetitive dive,

(e) the decompression tables that were used,

(f) the date the dive was undertaken, and

(g) remarks (such as name of employer, unusual incidents).

(4) The diving supervisor must keep a separate log of the diving operation containing the information required by subsection (3).

(5) The diving supervisor's log must be filed with the employer upon completion of the operation.

(6) All current logs must be available at the dive site for inspection by an officer.

24.15 Dive site equipment

When diving is in progress, the dive site must be provided with

(a) a current list of facilities with hyperbaric chambers capable of providing emergency treatment,

(b) the locations and phone numbers of the nearest hospital and available emergency assistance,

(c) if the no-decompression limit is to be exceeded, a 16 mm (5/8 in) synthetic line, marked at appropriate intervals for decompression stops, weighted and of sufficient length to reach the maximum depth for the dive,

(d) a first aid kit and an oxygen (O_2) therapy unit with sufficient capacity to reach emergency medical services,

(e) one complete set of acceptable dive tables and one copy of this Regulation,

(f) an appropriate means for entering and leaving the water, including a means for rescuing an incapacitated diver,

(g) equipment to provide voice communication with emergency services personnel, and

(h) other equipment as may be required by the Board.

[Amended by B.C. Reg. 348/2003, effective March 30, 2004.]

24.16 Lifelines

Divers tended on a lifeline must wear a suitable diver's harness and lifelines must be

(a) securely fastened to the diver's harness, but not attached to the diver's weight belt,

(b) free of knots and splices,

(c) secured to a permanent fixture at the surface, and

(d) tended at all times by a diver's tender.

24.17 Safe diving procedures

(1) Every employer engaged in diving operations must prepare and publish a set of safe diving procedures which include

(a) safe procedures and health requirements for each type of diving in which workers may be involved,

(b) all the procedures to meet the applicable requirements of this Regulation, and

(c) emergency, evacuation, and rescue procedures.

(2) The safe diving procedures must be kept at the dive site, readily available to all workers, and available for inspection by an officer.

24.18 Diving supervisor's worksite duties

(1) Each diving operation must be directed by a diving supervisor whose duties include

(a) evaluating the hazards,

(b) planning the dive,

(c) briefing the crew,

(d) ensuring that all needed equipment is available and in good working condition, and

(e) controlling the entire diving operation.

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

* See section 117 of the *Workers Compensation Act*.

(2) The diving supervisor must prepare a detailed plan of the diving operations which must be given to the worksite employer before diving commences.

(3) The diving supervisor must

(a) remain in the dive area during diving operations,

(b) delegate the supervisory responsibilities to another diving supervisor, if required to enter the water, and

(c) suspend diving operations if conditions become unsafe.

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

24.19 Crew briefing

Immediately before each dive, the diving supervisor must brief all persons involved in the diving operations about

(a) the hazards which may be encountered during the dive,

(b) the intended duration of the dive and the maximum depth to be reached,

(c) decompression procedures to be followed,

(d) the location of other divers,

(e) the work to be done,

(f) specific recall signals, and

(g) emergency procedures to be followed.

24.20 Diver's responsibilities

(1) Each diver must satisfy the diving supervisor that he or she fully understands the signals and procedures in use.

(2) Except in the case of accidental or unavoidable circumstances, a diver must not remain or be permitted to remain at any depth longer than the maximum time planned for that dive.

(3) In any diving operation the diver must inform the tender or diving partner and must proceed to the surface under any of the following conditions:

(a) if any malfunction in diving gear occurs;

(b) on receipt of any signal which cannot be understood;

(c) at the onset of any symptoms of physical or psychological distress;

(d) on receipt of a recall signal;

(e) when the main air supply is near depletion;

(f) if the emergency apparatus/air supply is being used;

24.21 Diving tables

(1) Diving operations, repetitive dives, and treatment of divers, must be carried out in strict accordance with tables and procedures published or approved by the Defense and Civil Institute of Environmental Medicine (Canada).

(2) Sport diving tables must not be used.

(3) Diving computers must not be used in place of primary diving tables.

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

* See also section 4.4 of the OHS Regulation.

24.22 Decompression procedures

(1) During diving operations which require decompression, a reserve breathing supply with sufficient reserve to bring divers to the surface with appropriate decompression stops must be available and ready for immediate use.

(2) Whenever planned dives will exceed the no-decompression limit

(a) the divers must be equipped with a bailout bottle containing a minimum 1.4 m^3 (50 ft^3) of breathing medium,

(b) an approved double lock hyperbaric chamber in operable condition with overriding outside controls and appropriate air facilities must be located so that travel time by available transport will not exceed 30 minutes,

(c) if the planned decompression time will exceed 15 minutes the hyperbaric chamber must be on the dive site, and

(d) a chamber operator must be available on the surface at the dive site or at the hyperbaric chamber.

(3) A dive must not exceed the no-decompression limit if the hyperbaric chamber is occupied.

24.23 Diver care and transportation

(1) The diving supervisor must ensure that on completion of decompression, the diver remains under observation in the general area of the hyperbaric chamber for a period of time to ensure the well-being of the diver.

(2) If a diver shows signs of pressure related illness or requires therapeutic recompression, the diving supervisor must ensure that treatment is initiated immediately and a physician knowledgeable in hyperbaric medicine is notified.

(3) If it is necessary to transport a diver suffering a diving ailment by air, provision must be made to furnish the patient with oxygen and the flight altitude must be prescribed by the attending physician or the diving supervisor.

24.24 Medical alert tag

A diver must wear a medical alert tag or bracelet stating the diver's status and indicating the possibility of decompression sickness or other diving illness, for at least 24 hours after completion of diving.

24.25 Hyperbaric chambers

Hyperbaric chambers must conform to standards acceptable to the Board and must be provided with

(a) a means of extinguishing a fire,

(b) an oxygen monitoring device,

(c) an oxygen delivery system with a built-in breathing system (BIBS), and

(d) an adequate supply of air, including an emergency reserve supply to complete any decompression and treatment procedures.

24.26 Breathing mediums

(1) If air is used as the respirable medium in diving operations it must meet the requirements of *CSA Standard CAN/CSA-Z275.2-92, Occupational Safety Code for Diving Operations*, with the exception of the water vapour standard.

(2) The air supplied by compressors for breathing air in diving operations must be tested at least annually to ensure that it meets the requirements of subsection (1).

(3) If mixed gases in other than the normal proportions of respirable air are used for breathing by divers, the diving supervisor must ensure that

(a) the diving procedures and schedules of work, and decompression are in accordance with the recommendations of a competent authority, and

(b) prior written authorization has been received from the Board to use mixed gases other than nitrox and that the authorization is kept on the dive site, available for inspection by an officer.

(4) The following requirements apply to operations using nitrox mixes:

(a) procedures and mixes must be acceptable to the Board;

(b) all workers involved with nitrox diving must be trained in the procedures to a standard acceptable to the Board;

(c) proof of training and a copy of the operating procedures must be readily available at each dive site.

24.27 Breathing apparatus

(1) All breathing apparatus and associated delivery systems must be correctly installed and tested for function before each use.

by an officer, and service records must be available to workers on the dive site.

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

* See also section 4.3 of the OHS Regulation.

24.28 Compressor intake

The compressor intake must be located so that the breathing medium will not be contaminated by gasoline vapours, engine exhausts, or other objectionable impurities.

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

* See also section 4.3 of the OHS Regulation.

24.29 Gauges and meters

(1) Gauges and meter equipment must be tested every 6 months or whenever a malfunction is detected, and errors found must be corrected without delay.

(2) If the equipment is removed from service, the specific problem with the equipment must be identified.

24.30 Warning devices

When any diving activity is taking place, warning devices must be displayed as follows:

(a) marker buoys must be used to display warning devices (flags, lights, lamps, or flares) to define the limits of the diving area, and boats other than those connected with the diving activity must be kept clear of the diving area;

(b) in navigable waters the recognized diver's flag must be flown or prominently displayed;

(c) flags and signals used for work site identification must only be displayed during active diving operations.

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

Note: The recognized diver's flag is a red square with a white diagonal stripe from the upper hoist to the lower fly.

24.31 Rescue boat

If divers are operating from floating equipment, a suitable power boat, ready for immediate use, must be available on the dive site, for rescue or escape.

24.32 Hoists

until the diver has been recovered.

(2) All directions to the hoist operator must be given by either the diver, the diver's tender or the diving supervisor.

24.33 Standby diver

(1) A standby diver must be

(a) on the dive site and able to render assistance at all times when diving operations are in progress,

(b) trained and equipped to operate at the depths and circumstances of the dive, and

(c) able to enter the water in one minute.

(2) A standby diver on the surface may also perform other duties provided such duties do not compromise the standby diver's ability to promptly render emergency assistance to the divers.

(3) When the diving supervisor can assure that the depth of the dive will not exceed 18 m (60 ft) and no hazards are present, 2 divers in the water may act as standby for each other provided that

(a) each diver is free swimming,

(b) the no-decompression limit is not exceeded,

(c) each diver has been trained to effectively rescue a diver in trouble and has demonstrated this ability to the diving supervisor's satisfaction,

(d) the divers are in close proximity to each other at all times so as to be able to effect rescue, and

(e) the divers are in constant audio communication with each other and the surface, or when using scuba they maintain constant physical or visual contact with each other.

(4) In subsection (3) **"no hazards are present"** includes but is not limited to a dive made in good weather conditions, where there are no appreciable currents, where there is good underwater visibility, no possibility of entanglement with underwater objects, and good access and egress to and from the dive site.

24.34 Incident investigation reports

(1) An incident investigation report meeting the requirements of Part 3 of the *Workers Compensation Act* and Part 3 of this Regulation (Rights and Responsibilities) must be submitted to the Board as soon as possible if any of the following occurs during a diving operation:

(a) injury or death;

(b) convulsions or serious impairment of consciousness during or after a dive;

(c) decompression illness;

(d) lung overpressurization;

(e) any serious mishap, even though the diver escapes actual injury, or a series of events which render equipment or procedures suspect, before, during, or after the diving operation.

(2) The facts must be recorded as soon after the incident as possible, and the report must include the dive profile and all relevant details.

(3) In the event of any diving incident,

(a) the Board reserves the right to take temporary possession of and investigate all equipment related to the diving operation, and

(b) the equipment must not be tampered with or altered in any manner until authorization has been received from the Board.

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24.35 Communication

Each diver using scuba must

(a) employ the buddy system whereby 2 divers remain, at all times, in constant visual or physical contact and both surface immediately if they lose that contact,

(b) be tended on a lifeline by a diver's tender,

(c) be in constant audio communication with the surface, or

(d) be tethered, with a minimum 10 mm (3/8 in) diameter synthetic line or equivalent, to an identifiable float located on the surface that is constantly visually monitored from a location that allows immediate assistance to be rendered in case of emergency.

24.36 Minimum crew

(1) A minimum crew of 3 workers must be present on each dive site if the dive will

(a) not exceed 18 m (60 ft) in depth, and

(b) remain within the no-decompression limit, and

(c) be made where it is known there is no hazard of entrapment.

(2) When using the buddy system, a minimum of 2 divers must be present, and a third person must stay on the surface as a supervisor/tender.

(3) When using lifelines, floats or audio communication with the surface,

(a) a standby diver and a supervisor/tender must be on the surface, and

(b) a tender must tend only one scuba diver unless the divers are on floats, or have lifelines and effective 3-way voice communication, in which case the tender may tend 2 divers.

(4) When a dive does not meet the requirements of subsection (1), then

(a) a standby diver and a supervisor/tender must stay on the surface, and

(b) if not using the buddy system, a single diver must be tethered and carry a bailout bottle.

24.37 Restrictions on scuba

(1) Scuba must not be used in underwater construction, burning, welding, salvage operations, demolition, jetting and suction dredging or other diving operations in which the diver

(a) may be entrapped,

(b) does not have free access to the surface,

(c) may be exposed to a contaminated environment, or

(d) could be adversely affected by hazardous underwater or surface work activities or conditions which could be alleviated if the diver were using surface supplied air.

(2) Divers using scuba must use open circuit apparatus providing a breathing medium by an automatic demand flow system.

(3) Recirculating apparatus may only be used with prior permission of the Board.

(4) Divers using scuba must not dive to depths greater than 40 m (130 ft) unless prior authorization has been received from the Board.

24.38 Equipment

(1) Each diver using scuba must use all of the following equipment appropriate to the diving conditions and as specified by the diving supervisor:

(a) a scuba unit complete with a quick release harness and a submersible pressure gauge;

(b) a face mask and swimming fins;

(c) a suitable knife and a depth gauge;

(d) an exposure suit and an inflatable buoyancy device;

(e) a weight belt with quick release buckle;

(f) an underwater watch with elapsed time indicator;

(g) an underwater light when night diving;

(h) other equipment as may be required by the Board.

(2) If a risk of entrapment is present, one complete spare set of underwater breathing apparatus with fully charged cylinders must be assembled at the dive site.

(3) When diving in open water, each free swimming diver must carry an audible or visual locating device such as a whistle, flare, or strobe light.

24.39 Testing cylinders

(1) Each scuba cylinder must be hydrostatically tested at least once every 5 years and visually inspected internally at least once a year.

(2) The hydrostatic test date must be affixed to the cylinder and entered into the maintenance log.

(3) The visual inspection date must be entered in the maintenance log.

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24.40 Minimum crew

(1) For each diving operation where planned dives do not exceed 40 m (130 ft) or the no-decompression limits, and where there are no hazards present, a minimum dive crew of 3 workers must be present, one of whom must be a diver's supervisor/tender, one a diver and one a standby diver on the surface unless the standby is permitted by section 24.33(3) to serve as a standby in the water.

(2) If the planned dive exceeds 40 m (130 ft), or the no- decompression limits, or there are hazards present, the dive crew must consist of a minimum of 4 workers: a diving supervisor, a diver's tender and 2 divers, one of whom must be a standby diver on the surface.

24.41 Diver's tender

(1) Each surface supplied diver must be tended, hands on, by a separate diver's tender.

(2) If audio communications are used, one tender may monitor 2 divers.

24.42 Diver's equipment

(1) Diver's boots must be patterned, constructed, and fastened to prevent their loss underwater.

(2) Every diver must wear a separate weight belt outside the diving dress, which

(a) if released must result in the diver achieving positive buoyancy, and

(b) must be inspected daily before commencing a diving operation.

(3) Non-return valves must be

(a) fitted to all surface supplied diving helmets, masks, and hookah diving systems, and

(b) checked before commencing a diving operation.

(4) Each diver must wear a bailout system and carry a suitable knife.

(5) When divers use a stage to carry out decompression diving, the stage must have an independent source of emergency breathing gases sufficient to complete any needed decompression of the diver.

24.43 Compressors

Compressors used to supply air to divers must be

(a) capable of maintaining a supply of air equal to at least double the volume of air required,

(b) capable of developing pressure at least 25% greater than the anticipated pressure requirement, and

(c) automatic in operation.

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

* See also section 24.28 of the OHS Regulation.

24.44 Volume tanks

Air from a low pressure compressor must be discharged into a volume tank of at least 100 litres (22 imp gal) capacity, fitted with

(a) a no-return valve on the inlet side,

(b) a pressure gauge,

(c) an over pressure relief valve, and

(d) a drain cock capable of draining any fluids.

24.45 Breathing air filters

Air supplied from a volume tank must be passed through a filtration system consisting of at least a water trap, a particulate filter and a chemical vapour absorbent.

24.46 Manifolds and fittings

(1) The manifold system must be provided with

(a) a primary and a reserve air supply capable of being isolated from each other, and

(b) piping of a diameter which ensures an adequate flow of gas to the diver(s).

(2) The reserve supply must provide a sufficient quantity of breathing mixture to enable the diver to return to the surface and undergo all "in water" decompression.

(3) If there is no voice communication with the diver, each surface supplied air system must be equipped with an audible low pressure alarm situated so that it can be heard by the diving supervisor and the diver's tender.

24.47 Breathing gas lines

(1) All stationary breathing air or mixed gas lines must be guarded against damage or interference.

(2) Each diver's air or mixed gas line must be fitted with a valve that is

(a) readily accessible,

(b) guarded against interference,

(c) clearly marked to identify the diver it services, and

(d) under the care and control of the diver's supervisor or diver's tender.

(3) Each diver's air or mixed gas line must be fitted with a pressure gauge to indicate the pressure being delivered to the diver, and the gauge must be located downstream of the diver's supply valve so that the dial and figures are clearly visible to the diver's tender.

(4) All hoses, pipes, couplings and other fittings used in any air or mixed gas line for divers must be designed and suitable for their intended use.

(5) Hoses must be protected from kinking and be capable of sustaining the required flow rates and pressures for the system used.

(6) Every umbilical must incorporate a lifeline to prevent stress on the hose or diver's helmet, and the umbilical and lifeline must be attached to a suitable diver's harness.

(7) The standby diver's umbilical and lifeline must be of sufficient length to reach the operating diver.

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24.48 General requirements

Divers who take part in deep diving operations must

(a) be tethered to the work base by a breathing gas umbilical,

(b) have effective two-way voice communications with the surface, and

(c) be supplied with a mixed gas breathing medium.

24.49 Hyperbaric chamber

An approved double lock hyperbaric chamber must be on the dive site and in operable condition.

24.50 Transportation to the underwater worksite

(1) If the depth of the dive is less than 73 m (240 ft) and the total "in water" ascent time is less than 1 hour, the diver must be transported to and from the underwater worksite by a stage, bell, or submersible compression chamber (SCC).

(2) If the depth or time exceeds the conditions in subsection (1) an SCC must be used to transport the diver.

(3) The standby diver must be stationed at the surface, or if an SCC is used the standby diver must be in the SCC.

(4) The diving supervisor must have a means of

(a) monitoring the depth of the diver and the SCC,

(b) controlling the pressures of the breathing mixtures supplied to each diver and the standby diver, and

(c) continuously analyzing the breathing mixture.

24.51 Rest periods

(1) If non-saturation diving techniques are used in a deep diving operation, the diving supervisor must ensure there is a rest period of at least 24 continuous hours following the completion of decompression.

(2) If saturation diving techniques are used, the diving supervisor must ensure that

(a) if the dive is to a depth of 150 m (500 ft) or less, a diver does not exceed 4 hours in the water and 4 hours as an attendant in the SCC,

(b) if the dive is deeper than 150 m (500 ft), a diver does not exceed 3 hours in the water and 3 hours as an attendant in the SCC, and

(c) in any 24 hour period, there is a rest period of at least 12 continuous hours after the applicable time limits in paragraphs (a) and (b) have been reached.

saturation dive unless at the discretion of a physician knowledgeable and competent in diving medicine.

Submersible Compression Chambers and (SCC) Lock-Out Submersibles (LOS)

24.52 Standards

Submersible Compression Chambers and Lock-Out Submersibles must meet the requirements of *CSA Standard Z275.1-93, Hyperbaric Facilities*.

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

* See also section 4.4 of the OHS Regulation.

24.53 General equipment requirements

Each SCC and LOS must be equipped to permit the transfer of persons under pressure into and from a surface compression chamber, and must have

(a) doors and hatches that act as pressure seals, and that may be opened from either side,

(b) valves, gauges, and other fittings necessary to control the internal pressure and to clearly indicate the internal and external pressures,

(c) spring loaded pressurization and main exhaust valves which will close when not held in the open position,

(d) a reserve breathing mixture for persons occupying or working from the SCC or LOS, which must be protected against inadvertent operation and be capable of being brought on line from within the SCC or LOS without outside assistance,

(e) a two-way voice communication system capable of continuously recording and saving the previous 4 hours of conversation, with emergency backup capabilities, through which a person in the SCC or LOS can communicate with the diving supervisor,

(f) heating and lighting equipment including emergency backup illumination,

(g) first aid equipment, without towelettes,

(h) a hoisting device to bring an unconscious or injured diver into the chamber,

(i) a standby diver's umbilical bundle which must be 3 m (10 ft) longer than the diver's umbilical bundle,

(j) a strobe light that is activated while the chamber is in the water,

(k) an emergency locating device with a surface receiver operating at 37.5 kHz,

(l) instruments to monitor temperature, oxygen and carbon dioxide levels within the chamber, and for an SCC the instrument readings must be readable on the surface,

(m) primary and emergency carbon dioxide scrubbers,

(n) hull integrity valves mounted on all gas and other penetrations into the submersible compression chamber,

(o) a secondary source of power for the diving systems and equipment that can be rapidly brought on line in the event the primary energy source fails, and

(p) in a diving operation in which an SCC is used, a sufficient quantity of breathing mixture to meet the needs of the occupants of the chamber for at least 24 hours.

[Amended by B.C. Reg. 348/2003, effective March 30, 2004.]

24.54 Design

Each SCC and LOS must be of a design that

(a) allows divers to enter and exit without difficulty,

(b) allows at least 2 divers, equipped and dressed for the diving operation, to be seated within, and

(c) in case of emergency, allows a diver within to disconnect or shear the primary lifting cable and the umbilical bundle.

24.55 Lifting gear

(1) Each SCC and LOS must be used in association with lifting gear that

(a) enables the SCC or LOS to be lowered to the depth at which the diving operation is to be carried out, without excessive lateral, vertical, or rotational movement taking place,

(b) is provided with, in addition to the primary lifting cable, a tag rope so designed that in the event of the primary cable breaking during an air water interface transfer, the tag rope will permit the SCC or LOS to descend only to a calm area immediately below the turbulent wave zone, and

(c) is provided with a secondary means of being returned to the surface in the event of failure of the main lifting gear.

(2) If use of the secondary means in subsection (1)(c) involves shedding weights, the controls for shedding weights must be operable from within the SCC or LOS and must incorporate a means to prevent the weights from being shed inadvertently.

24.56 Secondary lifting equipment

(1) An LOS must be provided with

(a) a secondary lifting eye or similar device of at least the same strength as the primary lifting eye, and

(b) a secondary lifting cable that is readily available and of at least the same strength as the primary lifting cable, and is compatible with the secondary lifting eye or similar device.

(2) An SCC must be provided with

(a) a secondary lifting eye or similar device of at least the same strength as the primary lifting eye, and

(b) a secondary lifting cable that is attached and capable of returning the SCC to the surface.

(3) An alternative means must be provided to return the SCC or LOS to the deck.

24.57 Diving system procedures

(1) The diving supervisor must ensure that a lock-out diving operation is not conducted from a submersible unless

(a) the submersible is negatively buoyant on the bottom or positively secured to the work site,

(b) the diving supervisor is on board the submersible and present in the one atmosphere chamber during the lockout operation, and

(c) a standby diver is monitoring the lock-out operation from the submersible's compression chamber and is dressed and equipped to immediately carry out rescue operations in the event of an emergency.

(2) The diving supervisor must ensure that lock-out submersible and atmospheric diving system operations are not conducted unless

(a) a backup unit with sufficient depth capabilities to effect a rescue is available for use in the event of an emergency,

(b) the on-board life-support system of the LOS is capable of sustaining life for a period of time that would enable the backup unit to reach the site of the diving operation and effect rescue, and

(c) a breathing mixture is provided that will meet the needs of the occupants for at least 48 hours.

Atmospheric Diving Systems (ADS)

24.58 Registration

The employer must ensure that an atmospheric diving system meets the requirements for registration with Lloyd's Registry of Shipping, the American Bureau of Shipping, or Det Norske Veritas.

24.59 General equipment requirements

An ADS must have

(a) valves, gauges, and other fittings necessary to control the internal pressure, and to clearly indicate the internal and external pressures,

(b) a reserve breathing mixture for persons occupying the ADS, a mixture which is protected against inadvertent operation and is capable of being brought on line from inside, without outside assistance,

(c) a two-way voice communication system, capable of continuously recording and saving the previous 4 hours of conversation, and with emergency backup capabilities, by which a person inside the atmospheric diving system can communicate with the diving supervisor,

(d) lighting equipment including emergency backup illumination,

(e) first aid equipment,

(f) heating equipment and thermal protection for all occupants,

(g) a strobe light that can be activated while the ADS is in the water,

(h) an emergency locating device with a surface receiver operating at 37.5 kHz,

(i) instruments to enable occupants to monitor the temperature, oxygen and carbon dioxide within the atmospheric diving system,

(j) a primary and an emergency means of scrubbing carbon dioxide,

(k) a device which allows the occupant to disconnect or shear the primary lifting cable and the umbilical bundle in an emergency, and

(l) in addition to the primary lifting cable, a tag rope or secondary lifting method so designed that in the event of the primary cable breaking during an air water interface transfer, the tag rope or secondary method will permit the ADS to descend only to a calm area immediately below the turbulent wave zone.

24.60 Secondary means of surfacing

(1) The employer must ensure that atmospheric diving operations are not conducted unless the atmospheric diving system is provided with a secondary means of returning to the surface in the event the main lifting gear fails.

(2) If use of the secondary means involves shedding weights, the controls for shedding weights must be operable from within and must incorporate a means to prevent the weights from being shed inadvertently.

24.61 Secondary lifting equipment

An ADS must be provided with

(a) a secondary lifting eye or similar device that is of at least the same strength as the primary lifting eye, and

(b) a secondary lifting cable that is readily available and of at least the same strength as the primary lifting cable, and is compatible with the secondary lifting eye or device.

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(1) The diving supervisor must ensure that altitude diving operations are conducted in accordance with acceptable altitude diving tables.

(2) Altitude diving procedures must address

(a) acclimatization at the dive site to reduce the diver's nitrogen load caused by the reduced atmospheric pressure at the increased altitude,

(b) the equivalent ocean depth in order to select the appropriate tables at the altitude,

(c) accurate methods of calculating the diver's actual depth of dive,

(d) calculation of the reduction in ascent rate due to the increase in altitude, and

(e) post dive travel considerations.

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24.63 Hazardous mechanisms

Before a diver enters the water all hazardous mechanisms must be

(a) secured against inadvertent movement, and

(b) locked out as required by Part 10 (De-energization and Lockout).

24.64 Intakes, pipes and tunnels

(1) If a diver is required to approach or enter the intake of any pipe, tunnel, duct, or similar installation the diver must be provided with the means to distinguish the specific intake from any others in the vicinity.

(2) A diver must not enter the water until flow through the intake is stopped and the intake mechanism is locked out, and the flow must not be restarted until the diver has left the water.

(3) If divers are required to approach a hazardous mechanism, a pressure differential structure, or the intake of any pipe, tunnel, duct or similar installation, the divers must use only surface-tethered diving equipment with effective two-way voice communication with the surface; if required to enter, they must use only surface supplied diving equipment with effective two-way voice communication with the surface.

24.65 Exceptional hazards

Additional dive team members with independent equipment and capable of effecting rescue must be on the dive site whenever diving operations incur exceptional risk of entrapment of a diver or loss of the diver's life support system.

24.66 Contaminated environments

(1) Before diving commences in a contaminated environment, an operational plan must be devised that is available at the dive site and provides for

(a) identification of the contaminants,

(b) special clothing or equipment to be used,

(c) potential adverse health effects to persons and special medical precautionary measures,

(d) identification of the exclusion zone, contamination reduction zone and the support zone, and protective clothing and equipment to be used in them,

(e) measures to be followed by personnel when moving from one zone to another,

(f) special first aid measures associated with exposure to the specific contaminants, and

(g) emergency telephone numbers to secure qualified assistance within adequate response times.

(2) The diving supervisor must ensure that

(a) emergency breathing apparatus is provided for surface support personnel if there is risk of inhaling dangerous contaminants during the diving operations,

(b) suitable apparel and equipment is worn by surface support personnel to prevent exposure to contaminants,

(c) an appropriate means of safely decontaminating personnel is available at the dive site,

(d) the dive site has the means and facilities to safely dispose of contaminated clothing and equipment,

(e) all diving systems and equipment exposed to the contaminant are inspected for deterioration before each dive,

(f) diaphragms of the first and second regulators and associated exhaust valves are inspected for deterioration before each dive, and

(g) contaminated diving systems and equipment are not removed from the dive site unless authorized by the diving supervisor, and are not used in any subsequent diving operation unless found free of all contaminants.

(3) A minimum crew of 4 workers must be present at a diving operation in a contaminated environment, one of whom must be a diver, one a diving supervisor, one a diver's tender, and one a standby diver.

(4) The diving supervisor must ensure that scuba is not used for diving operations in a contaminated environment.

(5) For dives in contaminated environments, the diving supervisor must ensure that divers use surface supply equipment including

(a) a surface supply diving helmet designed and suitable for such work,

(b) a totally enclosed diving suit, made of nonabsorbent material which mates to the helmet with a positive seal and locking device,

(c) a two-way voice communication system, and

(d) protective devices, where practicable, to minimize contaminant exposure to diving equipment.

(6) For dives in contaminated environments, the following zones must be established on site:

(a) a dedicated contamination reduction zone with suitable means to decontaminate personnel;

(b) a dedicated support zone with suitable means to decontaminate or dispose of apparel and equipment;

(c) a dedicated exclusion zone to handle the contaminant, accessible only to authorized and protected personnel.

(7) For dives in contaminated environments,

(a) workers entering the exclusion zone must wear appropriate personal protective equipment,

(b) workers must enter and leave the exclusion zone only through the contamination reduction zone, and

(c) no food, drink, or tobacco may be taken into the exclusion zone or the contamination zone.

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Live Boating

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24.67 General requirements

Live boating diving operations must be conducted only

(a) during daylight hours,

(b) in appropriate weather, current and sea conditions,

(c) from a vessel with the necessary maneuverability to ensure the diver's safety, and which is under the control of a competent master, and

(d) within the no-decompression limits.

The diving supervisor must ensure that

(a) a procedure or device is in place that will prevent the diver's lifeline or umbilical bundle from becoming entangled in the boat's propulsion system,

(b) the diver's tender is in a position of unobstructed view to the vessel master and the diving supervisor,

(c) the propulsion system is disengaged when the diver enters or leaves the water,

(d) the diver's umbilical or lifeline is monitored, hands on, by a diver's tender,

(e) there is continuous voice communication,

(f) no more than 70% of the diver's umbilical or lifeline is deployed during the diving operation,

(g) the vessel master is competent to perform live boating operations and is under the direct control of the diving supervisor during diving operations, and

(h) all dive crew members are familiar with their duties and responsibilities with respect to the diver's safety, and they may terminate the dive if the diver's safety is jeopardized.

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24.69 Application

Sections 24.70 to 24.143 apply to all owners, masters and crewmembers of licensed commercial fishing vessels.

24.70 Compliance with standards

All fishing vessels must

(a) be maintained in seaworthy condition, and

(b) if constructed after January 1, 1995, be built in accordance with applicable Canadian Coast Guard Regulations, or other standard acceptable to the Board.

24.71 Owner and master responsibilities

(1) An owner of a fishing vessel must ensure that all machinery and equipment on board a fishing vessel is capable of safely performing the functions for which it is used.

(2) The owner must ensure that major modifications to a fishing vessel do not adversely affect the

stability of the vessel.

(3) The master of a fishing vessel must ensure that

(a) machinery and equipment is properly maintained and functions safely during the voyage, and

(b) any replacement equipment meets the requirements of this Part.

24.72 Documentation

The owner of every fishing vessel must provide documentation on board, readily accessible to crewmembers, which describes

(a) engine room instructions,

(b) vessel characteristics, including stability,

(c) the location and use of firefighting equipment, and

(d) the location and use of emergency equipment, including radio equipment.

24.73 Instruction

(1) Before the start of each fishing season, the master must ensure that each crewmember is instructed in the operational characteristics of the fishing vessel including

(a) the location and use of safety equipment, engine room components and controls,

(b) deck equipment and rigging,

(c) navigation equipment and electronic aids,

(d) fishing equipment and its use, including safe work practices for each fishery the vessel will be engaged in,

(e) procedures for anchoring the vessel,

(f) the location and use of emergency equipment, including firefighting and radio equipment, and

(g) escape routes in the event of fire.

(2) The master must ensure as far as is reasonably practicable, that the instruction required by subsection (1) results in each crewmember being able to apply the information as needed to protect the crewmember's health and safety.

(3) New crewmembers joining the vessel must be instructed in accordance with the requirements of this section at the time that they join the vessel.

24.74 Emergency procedures

emergencies including

(a) crewmember overboard,

(b) fire on board,

(c) flooding of the vessel,

(d) abandoning ship, and

(e) calling for help.

(2) The master must ensure that drills are conducted at the start of each fishing season, when there is a change of crew, and at periodic intervals to ensure that crewmembers are familiar with emergency procedures.

24.75 Crewmember responsibility

Crewmembers must take all reasonable precautions necessary to ensure the health and safety of themselves and other persons on board the fishing vessel.

24.76 Vessel preparation

Before leaving on a voyage the master must ensure that the fishing vessel is capable of safely making the passage, due consideration being given to

(a) the seaworthiness of the vessel,

(b) the stowage and securing of all cargo, skiffs, equipment, fuel containers and supplies,

(c) ballasting, and

(d) present and forecast weather conditions.

24.77 Reporting injuries

(1) Crewmembers must report all injuries to the master, without delay.

(2) The master must report to the owner of the fishing vessel all injuries that required medical aid and record all injuries in the vessel log book.

24.78 Unsafe conditions

(1) A crewmember who observes an unsafe or harmful condition or situation must immediately report it to the master.

(2) The master must ensure that action is taken, without delay, to correct an unsafe or harmful condition or situation.

Repealed. [B.C. Reg. 348/2003, effective March 30, 2004.]

* See sections 3.14 to 3.21 in the OHS Regulation and the definition of "employer" in section 106 of the *Workers Compensation Act*.

24.80 Slipping and tripping hazards

(1) All work areas must be kept

(a) clear of unnecessary obstructions, and

(b) free of slipping and tripping hazards.

(2) Decks must have non-skid surfaces except in those locations where a smooth deck is required for handling fish.

(3) Tools and equipment must be securely stowed when not in use.

24.81 Guarding of equipment

The owner of a fishing vessel must ensure that moving parts of power operated equipment are, where practicable, fitted with effective guards if such parts constitute a danger to crewmembers.

24.82 Inspection of rigging

The master must ensure that all rigging is maintained and inspected regularly to ensure that it is able to safely carry out the work for which it was designed.

24.83 Access and egress

Every portable ladder or gangway between a fishing vessel and shore, between vessels, or when used on board a vessel must be designed and rigged to provide safe access and egress.

24.84 Protection from falling

(1) Crewmembers must be protected from falling overboard by means of grabrails, siderails, handrails, guardrails or personal fall protection equipment.

(2) Crewmembers working aloft or on deck during adverse weather conditions must tie off to a lifeline to prevent falling.

24.85 Deck openings

(1) Deck openings and hatches on a fishing vessel must be

(a) equipped with an effective means of securing them, and

(b) closed and secured when it is not essential to the fishing operation that they be open.

(2) When deck openings and hatches are required to be open for ventilation or other purposes, they must be marked and guarded.

24.86 De-energization

(1) The maintenance and repair of machinery or equipment on board a fishing vessel must only be carried out when the power source has been de-energized and effectively secured to prevent inadvertent startup.

(2) If it is essential that equipment remain operational during the maintenance process, the master must establish a procedure to prevent injury from contact with moving or energized parts.

(3) The main engine must be shut off whenever a diver is conducting work underwater in proximity to the vessel.

24.87 Equipment control devices

(1) Winches, drums, capstans, and similar equipment on board a fishing vessel must have at least one master on/off control that is readily accessible on deck.

(2) Drum pedals and other types of hold-to-run controls must not be bypassed or otherwise rendered ineffective.

24.88 Braking devices

Winches and drums capable of freewheeling must be fitted with an effective braking device.

24.89 Illumination

All work areas on board a fishing vessel must be sufficiently illuminated to enable work to be done safely.

24.90 Ventilation

All crew spaces on fishing vessels must be provided with an adequate supply of fresh air either by passive or mechanical means.

24.91 Propane installations

Propane, liquefied petroleum gas (LPG) and compressed natural gas (CNG) installations, used for appliances on fishing vessels must be in conformity with the *NFPA Standard 302-1989, Fire Protection Standard for Pleasure and Commercial Motor Craft*.

24.92 Galley requirements

(1) Galley stoves on fishing vessels must be fitted with rails or other means to restrain the movement of cooking utensils, and to prevent inadvertent contact by crewmembers.

(a) be fitted with a shutoff valve at the tank, and

(b) not be located directly above the stove.

(3) Galley stoves must

(a) be secured to prevent movement, and

(b) have sufficient clearance to permit the effective cleanup of oil and grease.

24.93 Requirements for sensors and alarms

(1) An owner of a fishing vessel must ensure that a heat sensor, connected to an alarm system, is installed

(a) above the galley stove or near the stove pipe, and

(b) in proximity to the engine exhaust.

(2) The owner must ensure that a water level sensor, connected to an alarm system, is installed

(a) in the machinery space bilges, and

(b) in the shaft log or lazarette.

(3) The owner must ensure that main engines are fitted with low oil pressure and high temperature sensors connected to an alarm system.

(4) The owner must ensure that a sensor and alarm system is installed if the Board considers this necessary to detect leaks of potentially explosive fuel used in engines or appliances.

(5) The owner must ensure that an audible marine grade carbon monoxide sensor, connected to an alarm system where practicable, is installed in crew quarters.

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

24.94 Confined spaces

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

* See Part 9 (Confined Spaces) of the OHS Regulation.

24.95 Controlled products

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

* See Part 5 (Chemical Agents and Biological Agents) of the OHS Regulation.

24.96 Protection against cold

provides adequate protection against cold.

24.97 Crewmember overboard

(1) Every fishing vessel must carry, for each crewmember, one immersion suit meeting standards acceptable to the Board.

(2) The master of a vessel must ensure that there is suitable equipment on board and that procedures have been developed which will enable the prompt recovery of a crewmember overboard.

24.98 Davits

The owner of a fishing vessel must ensure that all moveable davits are fitted with an effective locking device.

24.99 Communication

The master must ensure that effective procedures are developed to communicate between the bridge and all work areas on the vessel.

24.100 Ozone generators

The owner of a fishing vessel must ensure that ozone generating equipment is installed and operated in accordance with standards acceptable to the Board.

24.101 Loading and offloading

The master of a fishing vessel carrying fish or cargo must establish safe procedures for the loading and offloading of fish and cargo.

24.102 Work areas and operations

All work areas must be arranged and operations organized to minimize the potential for injury to crewmembers, including strains and sprains.

24.103 Proper lifting

The master must ensure that crewmembers are instructed in and use proper lifting techniques.

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Salmon

24.104 Drums

The owner of a gillnet vessel must ensure that drums are fitted with

(a) an effective ratchet device for picking up the net under heavy strain,

(b) an effective brake to maintain control when setting out the net, and

(c) a hold-to-run control.

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

24.105 Pin rollers

(1) The owner must ensure that pin rollers are of a design to prevent their inadvertent lifting.

(2) The master must ensure that pin rollers are maintained to prevent their inadvertent lifting.

Herring

24.106 Work areas and safeguarding

(1) Work areas on herring skiffs and punts must be arranged to prevent contact with moving equipment such as beaters and live rollers.

(2) The owner of a herring gillnet vessel must ensure that drums are fitted with

(a) an effective ratchet device for picking up the net under heavy strain and an effective brake to maintain control when setting out the net, and

(b) a hold-to-run control or other equally effective safeguard to stop the drums if a worker becomes entangled in the net or lines being wound in by the drum.

[Amended by B.C. Reg. 243/2006, effective January 1, 2007.]

24.107 Fouled propellers

The master of a herring skiff or punt must develop safe work procedures to direct crewmembers in how to clear fouled propellers.

24.108 Hauling net anchors

The owner must ensure that, when required by fishing conditions, herring skiffs and punts are fitted with mechanical means for hauling net anchors.

24.109 Brailers

Crewmembers must keep clear of brailers when unloading herring.

24.110 Towing skiffs

The master of a fishing vessel that will tow a skiff or punt must develop safe procedures for towing in all weather conditions including

(a) a means of self bailing,

(b) the use of tow line shock absorbers, and

(c) the use of drogue devices to prevent sheering and overtaking.

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24.111 Gloves

Crewmembers must wear hand protection acceptable to the Board when handlining.

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24.112 Setting procedures

The master must establish safe procedures for setting gear to prevent crewmembers being caught by hooks and other gear.

24.113 Knives

Each setting and hauling station must be equipped with a knife capable of cutting the gear.

24.114 Guarding

Drums and automated systems using longlines with hooks attached must be guarded or shielded to prevent inadvertent contact with hooks.

24.115 Hoisting device

If there is a potential for injury to crewmembers, a hoisting device must be provided and used to lift large fish.

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General Requirements

24.116 Hairpins and ringstrippers

(1) Seiners built after January 1, 1995 must be fitted with ringstrippers.

(2) The owner of a seiner must ensure that hairpins or ringstrippers on the vessel are designed and constructed so that crewmembers will not be endangered by their use.

(3) The master of a seiner must, if applicable, develop safe hairpin or ringstripper operating procedures which include

(a) consideration of sea and tide conditions,

(b) crew coordination,

(c) communication,

(d) spooling gear,

(e) drumming, and

(f) hoisting and securing.

24.117 Spooling gear

(1) The owner of a seiner must ensure that pursing winches and leads are positioned to permit proper spooling.

(2) Crewmembers must keep clear of the stern spooling gear while it is in operation.

24.118 Lifting the bag

(1) Whenever drawing the bag over the stern presents a risk of equipment failure or vessel instability, alternate procedures such as splitting the lift or brailing must be developed and used.

(2) Crewmembers must stay clear of the bag when it is brought over the stern roller.

24.119 Drum operation

Crewmembers operating the drum must not leave the controls while the drum is turning.

24.120 Brailing

The master of a seiner carrying a brailer must ensure that crewmembers are instructed in safe brailing procedures.

24.121 Purse rings

Purse rings on all seine nets must be secured to the middle of the ring strap to prevent rings from falling when fleeting the net through the power block.

24.122 Pumps

(1) The owner of a seiner carrying pumping gear must ensure that it is capable of pumping fish from the bottom of the bunt while on a set.

(2) If 2 or more fishing vessels are working in a team, the pumping gear may be shared between the vessels.

24.123 Drying up

The master of a seiner must establish a safe drying up procedure which includes

(a) communication on deck and between vessels,

(b) coordination of activities,

(c) securing the net,

(d) hoisting fleets, and

(e) the means of jettisoning the set should the vessel become endangered.

24.124 Power blocks

(1) Power block haul lines must be minimum 25 mm (1 in) diameter double braid nylon or equivalent.

(2) The master must ensure that power block haul lines are inspected frequently and maintained in safe condition.

(3) Haul lines must be shackled to the power block.

(4) A power block must be equipped with an effective safety line when suspended above the deck.

Seine Skiffs

24.125 Communication

The master of a seiner must ensure there is an effective means of communication between the vessel and the skiff during towing operations.

24.126 Skiff design

(1) Decks and floors of skiffs must be non-skid.

(2) Rails and sides of skiffs must be maintained free of protrusions that could snag the net.

24.127 Equipment stowage

Lines and other necessary equipment in skiffs must be securely stowed to prevent slipping and tripping.

24.128 Personal flotation devices (PFDs)

When in the skiff, crewmembers must wear personal flotation devices meeting the requirements of the Board.

24.129 Engine exhaust

The owner must ensure that the exhaust system for an engine in a powered skiff

(a) directs the exhaust away from crewmembers, and

(b) is shielded to prevent burns.

24.130 Capsize protection

(1) Towposts in skiffs must be designed and installed to minimize the potential for capsizing.

(2) Power skiffs must be operated in a manner that eliminates the danger of capsizing from backlash in the net.

Beachline Operations

24.131 Instruction

(1) The master of a salmon seiner must ensure that only trained and adequately supervised crewmembers are permitted to tie up to the beach during fishing operations.

(2) The training required in subsection (1) includes instruction in

(a) proper knots,

(b) assessing the tie-up,

(c) beachline straps,

(d) communication,

(e) tying and untying procedures, and

(f) cutting the strap.

24.132 Tie-up sites

Beach tie-up sites must be selected with due regard for the health and safety of crewmembers, consideration being given to terrain, wind and sea conditions.

24.133 Personal protective equipment

Crewmembers engaged in beach tie-ups must

(a) wear appropriate gloves and footwear meeting the requirements of the Board, and

(b) carry a knife capable of cutting the beachline or strap.

24.134 Night operations

The master of a salmon seiner must not conduct beach operations during darkness unless

(a) crewmembers are properly trained in night-time procedures,

(b) crewmembers in the skiff wear high visibility apparel,

(c) the vessel has the capability of adequately illuminating the work area, and

(d) an effective means of communication is established between the skiff and the seiner.

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24.135 Master's responsibility

The master must ensure that the stability of the fishing vessel is not compromised by

(a) the number of traps loaded on the vessel, and

(b) the manner in which the traps are loaded.

24.136 Securing traps

Traps must be secured to prevent inadvertent swinging or other movement during setting and hauling.

24.137 Lifelines

Crewmembers working on the stern setting black cod traps must be tied off with a safety belt or harness, and lifeline, both meeting standards acceptable to the Board.

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24.138 Safe work procedures

(1) The master must establish safe work procedures for shooting and hauling trawls.

(2) When shooting the trawl, crewmembers must stay clear of the net once the cod end is overboard.

(3) When hooking up and unhooking trawl doors on the davits, crewmembers must stay clear of pinch points.

(4) The master must establish a safe fleeting procedure.

24.139 Securing areas and equipment

(1) Open stern ramps must be roped off or otherwise guarded except when the area must be open for trawling operations.

(2) Beams must be secured to prevent inadvertent movement when attaching or detaching plumb staffs.

(3) Trawl doors and otter boards must be secured to davits when not in use.

(4) Shrimp and fish boxes must be secured to prevent inadvertent movement.

24.140 Splitting straps

All trawl cod ends must be fitted with splitting straps.

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24.141 Trolling poles

Trolling poles and stabilizer poles must be fitted with safety straps or other devices to limit their downward travel and to lock them in the down position.

24.142 Gurdy brakes

Gurdy braking devices must be maintained in good working order.

24.143 Cockpit covers

Cockpits must be equipped with covers and an adequate means to secure them in adverse weather.

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Part 25 Camps

Part 25 Camps

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Note

The Regional Health Boards and Community Health Services Societies administer the Industrial Camps Health Regulation, which addresses matters such as water supply, sanitation and sleeping quarters.

The Occupational Health and Safety Regulation applies to camps to the extent they are workplaces in which workers such as cooks, maintenance people and others work.

If Board officers, in the course of their duties, find conditions in camps which may be of concern under the Industrial Camps Health Regulation, the matter will be referred to the attention of the appropriate officials.

Questions about the administration of the Industrial Camps Health Regulation should be directed to the officials responsible for its administration.

Part 26 Forestry Operations and Similar Activities

MECHANICAL FALLING

TRAFFIC CONTROL FOR FALLING OPERATIONS

YARDING

SKIDDING

FORESTRY WORK AREAS

HAULING

ROADS AND ROAD MAINTENANCE

WATER OPERATIONS

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26.1 Definitions

In this Part

"active falling area" means the area within a 2 tree length radius of where a faller or mechanized falling equipment is located and equipped so as to be able to fall timber;

"backspar" means a tree rigged up at the back end of a work area to support a skyline;

"binder" means a wire, synthetic rope, chain or other device that is secured by a cinch and placed around logs on a logging truck or trailer to prevent the logs from spilling;

"bucker" means a worker who cuts up trees on the ground;

"bunk" means the bottom section of the cradle assembly on a logging truck or trailer onto which logs are placed;

"butt rigging" means a system of swivels, shackles, links and hooks which connect the haulback and mainlines and to which chokers are fastened;

"cable logging" means a yarding system employing winches, blocks and cables;

"dangerous tree" means a tree that is a hazard to a worker due to

(a) its location or lean,

(b) its physical damage,

(c) overhead conditions,

(d) deterioration of its limbs, stem or root system, or

(e) any combination of the conditions in paragraphs (a) to (d);

"faller" means a worker who manually falls trees;

"forestry operation" means a workplace where work is done in relation to silviculture or harvesting trees, including constructing the means of access and transporting the harvested trees to a facility where they are processed or from which they are exported;

"haulback" means the cable used to outhaul the rigging or grapple when yarding;

"high lead" means a cable logging system in which running line lead blocks are placed on a lift tree or on a mobile yarder to provide lift to the logs during yarding;

"holding wood" means the hinge of wood left uncut between the back of the undercut and the backcut;

"intermediate spar" means a tree used to elevate a skyline between the yarder and the backspar in a multispan skyline system;

"landing" means the area to which logs are

(a) yarded or skidded for sorting, and

(b) prepared for transportation;

"lift tree" means a tree rigged to support running lines;

"log transporter" means any of the following used to transport logs on roads:

(a) a truck;

(b) a trailer;

(c) a truck and trailer assembly;

"mainline" means the cable used to yard logs;

"mobile yarder" means a logging machine mounted on wheels, tracks or skids, incorporating a vertical or

logging system;

"molly hogan" means a single strand of wire rope rolled into a circle with 6 complete wraps that may be used as a temporary method of connecting the eye splices of 2 lines of the same size or in pin shackles to replace the cotter pin;

"multiple-employer workplace" has the same meaning as in section 118 of the *Workers Compensation Act;*

"prime contractor" has the same meaning as in section 118 of the *Workers Compensation Act;*

"sapling" means an immature tree that ordinarily would not be harvested;

"skidding" means moving logs by the use of mobile equipment that travels while the logs are being dragged;

"skyline" means a cable on a yarder that supplies lift for yarding lines, blocks, rigging, carriage and logs;

"slackline" means a skyline that can be tensioned at the operator's discretion;

"spar" means a tree or mast on which rigging is hung for a cable logging system;

"strawline" means a small diameter cable used in rigging up or moving larger cables or blocks;

"turn" means one or more logs that are skidded or yarded to the landing at one time;

"yarding" means moving logs by the use of mobile or other equipment that does not travel while the logs are being moved.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

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26.1.1 Prime contractor requirements for forestry operations

If the owner of a forestry operation enters into an agreement referred to in section 118 (1) of the Act designating a person to be the prime contractor for a workplace, the owner must ensure that

(a) the person designated

(i) is qualified to be the prime contractor in respect of that workplace, and

(ii) has the authority necessary to fulfill the responsibilities of prime contractor under the Act, including, without limitation, authority over any employer, worker or other person who may be carrying out the

(b) not more than one person holds the designation of prime contractor for that workplace at any given time.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.1.2 Multiple-employer workplace

(1) This section applies to a multiple-employer workplace in a forestry operation.

(2) Before starting any activity that is likely to create a hazard for an independent operator or a worker of another employer, the person intending to carry out the activity must notify the prime contractor.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.2 Planning and conducting a forestry operation

(1) The owner of a forestry operation must ensure that all activities of the forestry operation are both planned and conducted in a manner consistent with this Regulation and with safe work practices acceptable to the Board.

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

(3) The planning required under this section must

(a) include identification of any work activities or conditions at the workplace where there is a known or reasonably foreseeable risk to workers,

(b) be completed before work commences on the relevant activity, and

(c) be documented at the time of planning.

(4) If, after any planning referred to in subsection (3), there is a change in the workplace circumstances, including the work activities and the conditions of the workplace, and the change poses or creates a known or reasonably foreseeable risk to workers that was not previously identified, then

(a) the plan must be amended to identify and address the risk and provide for the health and safety of the workers at the workplace, and

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

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.3 Training

(1) Every worker in a forestry operation must receive the training necessary to safely perform the worker's duties.

(2) The requirements of subsection (1) are deemed to have been met with regard to duties of a type

(a) the worker performed the duties regularly for at least 2 years prior to that date, and

(b) the duties performed were documented by April 15, 1999.

(3) Records must be kept, in a form and manner acceptable to the Board, of the training provided in subsection (1).

(4) On request of a worker, a copy of the records under subsection (3) that pertain to the worker must be provided to the worker.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.3.1 Forestry operation fire fighting

(1) Workers in a forestry operation who fight a forest fire must be

(a) trained in their fire fighting duties in accordance with a standard acceptable to the Board, and

(b) physically capable of performing their duties safely and effectively.

(2) Training must be provided annually to every worker who is required to fight forest fires and records must be kept of the training provided to each worker.

(3) Except under emergency conditions, a worker who is fighting a forest fire must wear

(a) long pants and a long sleeved shirt made of cotton, wool, denim or flame resistant material, or

(b) other protective clothing appropriate to the hazards to which the worker may be exposed.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.4 Notice of project

(1) This section

(a) applies to a workplace in a forestry operation where the work is expected to last more than 5 working days, but

(b) does not apply where the work is limited to

(i) timber cruising,

(ii) forestry road or cutblock layout, or

(iii) surveying.

(2) Not more than 30 days and not fewer than 24 hours before the start of work at a workplace, the owner for whom the work is being done must ensure that a notice of project is provided to the nearest Board office.

(3) If it is necessary to do immediate work in order to prevent injury to workers or damage to property,

ensure that a notice of project is provided to the nearest Board office at the earliest possible time.

(4) A notice of project under subsection (2) or (3) must be provided in a form and manner acceptable to the Board.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.5 Initial safety meeting

(1) In this section, **"new work location"** means a work location in a forestry operation where the crew of workers has not previously worked.

(2) Before a crew of workers starts work in a new work location, a crew safety meeting must be held to inform the workers of any known or reasonably foreseeable risks in that location and the actions to be taken to eliminate or minimize those risks.

(3) If a worker did not attend the crew safety meeting under subsection (2) for a new work location, before starting work in that location, the worker must receive a safety orientation that covers any known or reasonably foreseeable risks in that location and the actions taken to eliminate or minimize those risks.

(4) Records must be kept of the crew safety meetings and safety orientations provided under subsections (2) and (3).

26.6 Working alone

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.7 Highly visible clothing

(1) Highly visible outer clothing that meets the requirements of Part 8 must be worn by a worker in a forestry operation if

(a) the worker may be endangered by any moving equipment or line,

(b) the worker's location must be routinely checked, or

(c) the worker is involved in harvesting trees at night.

(2) Safety headgear worn by a worker in a forestry operation must be a high visibility colour that contrasts with the background against which the worker is working.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.7.1 Climbing equipment

(1) In this section, **"climber"** means a worker who climbs trees or wooden spars at the workplace.

(2) Unless a climber uses other equipment acceptable to the Board, a climber must use

(b) a climbing rope or strap, and

(c) climbing spurs.

(3) If a climber must disconnect the climbing rope or strap in order to move by an obstacle, the climber must use a second climbing rope or strap to ensure continuous protection while passing the obstacle.

(4) Before a climber begins a climbing activity, a written climber rescue plan must be developed and communicated to all persons associated with the climbing activity.

(5) If a climber rescue plan requires another climber,

(a) a duplicate set of climbing equipment must be available for immediate use at the climbing work site, and

(b) the other climber must be available to carry out any required rescue.

(6) If there is a possibility of a climbing rope or strap being severed in the conditions present at a climbing work site, then

(a) the rope or strap must be made of material that cannot be severed, or

(b) the climber must use a second climbing rope or strap.

(7) Climbing equipment must be maintained in good order.

(8) A climber must inspect the climbing equipment before each use to ensure it is in good order.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.7.2 Weather conditions

When weather conditions create a hazard for a worker in a forestry operation, additional precautions must be taken as necessary for the safe conduct of the work.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.8 Cutting cables

A hammer or axe must not be used to cut wire rope, unless designed for that purpose.

26.9 Chainsaw training

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

26.10 Metal in saw logs

A spike, drift bolt, nail, or any other metal must not be left in any recoverable log.

(1) If it is known or reasonably foreseeable that work will expose a worker to a dangerous tree,

(a) the tree must be felled, or

(b) a risk assessment of the tree must be undertaken by a person who has completed a training program acceptable to the Board.

(2) If a risk assessment under subsection (1) determines that a tree poses a risk to a worker, the recommendations made in the risk assessment for eliminating or minimizing the risk must be implemented before the work referred to in that subsection starts.

(3) Despite subsections (1) and (2), if work in a forestry operation is to be carried out in an area that has more than 500 dangerous trees per hectare, the Board may approve a request to work without felling or assessing all the dangerous trees if, before the work starts,

(a) a person who has completed a training program acceptable to the Board conducts a risk assessment of a representative sample of the dangerous trees, and

(b) any recommendations made in the risk assessment for eliminating or minimizing the risks are implemented.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.12 Vehicle load limits

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

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26.12.1 Equipment capabilities

(1) Any equipment designed for a specific function in a forestry operation or adapted for use in a forestry operation must be capable of performing safely the functions for which it is being used.

(2) The requirements of subsection (1) are met if the equipment is used

(a) in accordance with the manufacturer's instructions,

(b) as specified by a professional engineer, or

(c) in a manner acceptable to the Board.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.12.2 Radio controlled equipment

In a forestry operation, any equipment that is controlled by a remote control device must be equipped with a "fail safe" or "stop" mechanism that becomes operational if the remote control device fails.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.13 Non-slip floors and controls

Foot controls, floors, steps and similar surfaces where workers in a forestry operation walk or stand must be constructed of, or covered with, a non-slip material suitable for the footwear worn.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.13.1 Equipment operator protections

(1) Protective guards must be provided and used on a self-loading log transporter or similar equipment unless

(a) it is not practicable to do so, and

(b) the absence of guards does not pose a hazard to the equipment operator.

(2) The heel bar on the operator's side of the loader boom of a self-loading log transporter must be equipped with a deflector shelf and must not be used for heeling logs.

(3) If pushing or pulling the boom too far on logging equipment could cause the backstop to crush the equipment operator's cab, boom stops must be installed on the equipment.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.13.2 Maintaining operator vision

Log handling equipment must not be moved with a load lifted higher than is necessary to provide unobstructed vision for the equipment operator.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.13.3 Mobile yarders

(1) A mobile yarder must have a permanently attached, legible and easily visible sign provided by the equipment manufacturer or a professional engineer that includes the following:

(a) the name of the manufacturer and the date of manufacture of the yarder, unless this information cannot be determined;

(b) the model and serial number of the yarder, unless this information cannot be determined;

(c) if the yarder is designed for skyline, slackline or modified slackline systems, the maximum and

(d) the maximum diameter of the mainline of the yarder;

(e) if required for the yarder, the minimum size, number and placement of guylines;

(f) if required for the yarder, the placement and number of outriggers;

(g) the permissible yarding angles of the yarder;

(h) the auxiliary equipment that may be safely attached to the yarder.

(2) Subsection (1) is satisfied if the information is available at the workplace where the mobile yarder is located.

(3) A mobile yarder must be rigged and used in accordance with the information provided under subsection (1) (c) to (h).

(4) A mobile yarder must not be moved with the spar or tower in the vertical operating position unless the stability of the equipment can be maintained.

(5) Multiple throttle controls on a mobile yarder must be arranged to prevent the simultaneous operation of 2 or more controls.

(6) A mobile yarder and its attached equipment must be inspected frequently and at least as often as specified in the equipment manufacturer's instructions.

(7) Manufacturer's manuals for a mobile yarder must be available, at the workplace where the yarder is located, to the following persons:

(a) the yarder operator;

(b) any person maintaining the yarder.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.14 Equipment clearance

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.14.1 Hazard area of logging equipment

(1) A hazard area created by the operation of logging equipment must be identified.

(2) Every hazard area identified under subsection (1) must be communicated to all workers in close proximity to the operating logging equipment and to the hazard area.

(3) A worker must not enter into or proceed on foot through a hazard area referred to in subsection (1) unless the equipment operator first gives permission to the worker in a clear and unmistakable manner.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

(1) A safe work area must be designated for workers on foot in close proximity to any operating logging equipment.

(2) The boundaries of a safe work area designated under subsection (1) must be communicated to all workers within and in close proximity to the safe work area.

(3) No equipment may enter into or proceed through a safe work area unless

(a) the equipment operator first obtains permission in a clear and unmistakable manner from all of the workers in that safe work area or from the supervisor of those workers, and

(b) those workers take a safe position.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.14.3 Traffic control

If vehicles on a road in a forestry operation are required to drive through a hazard area identified in section 26.14.1 or through a safe work area designated in section 26.14.2, effective traffic control appropriate to the hazard must be implemented.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.15 Log pile heights

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.16 Slope limitations

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

(2) If the manufacturer's maximum slope operating stability limit for logging equipment is known, the equipment must be operated within that limit.

(3) If the manufacturer's maximum slope operating stability limit for logging equipment is not known, the equipment must be operated within the following limits:

(a) a rubber tired skidder must not be operated on a slope which exceeds 35%;

(b) a crawler tractor, feller buncher, excavator and other similar equipment must not be operated on a slope which exceeds 40%;

(c) any other forestry equipment specifically designed for use on a steep slope must not be operated on a slope which exceeds 50%.

(4) Despite subsections (2) and (3) but subject to subsection (5), logging equipment may be operated beyond the maximum slope operating stability limits specified in those subsections if

(a) a qualified person conducts a risk assessment of that operation, and

equipment's stability during operation.

(5) Despite anything in this section, logging equipment must not be operated in a particular location or manner if its stability cannot be assured during that operation.

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

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.17 Weather conditions

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.18 Landslides

In a forestry operation where there may be a risk of a landslide

(a) the risk must be assessed in accordance with a standard acceptable to the Board,

(b) if a risk is found to be present, written safe work procedures must be developed meeting the requirements of the standard, and

(c) workers must be educated in the safe work procedures.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

26.19 Forest fire fighting

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.20 Night operations

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

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26.20.1 Application

Sections 26.21 to 26.29 apply only to manual falling and bucking activities.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.21 Faller qualifications

(1) A worker must not fall trees or be permitted to fall trees, or conduct or be permitted to conduct bucking activities associated with falling trees, unless

(a) the worker is qualified to do so to a standard acceptable to the Board, and

(b) the work being performed is within the documented and demonstrated capabilities of that worker.

(2) Subsection (1) (a) does not apply to a worker who is in a falling or bucking training program that is acceptable to the Board.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.22 Forestry operation faller training

(1) A worker may not work as a faller in a forestry operation unless the worker receives training for falling that is acceptable to the Board and is certified in writing as a competent faller under this section.

(2) Without limiting subsection (1), faller training must include the following:

(a) taking basic training in falling trees by working one-on-one with a qualified faller or trainer for a period of not less than 30 days;

(b) in the presence of a qualified supervisor or trainer, taking a written or oral examination on falling;

(c) after completion of basic training under paragraph (a) and passing the examination under paragraph (b), working as a trainee faller under the close supervision of a qualified faller or trainer for a minimum period specified in subsection (3).

(3) The required minimum supervision period in subsection (2) (c) is

(a) 180 days, or

(b) a shorter period as determined by a qualified supervisor or trainer, if the supervisor or trainer is satisfied that the worker is competent to perform the tasks of a faller.

(4) The person supervising a trainee faller under subsection (2) (c) must

(a) evaluate the trainee's work on a weekly basis,

(b) keep records of all evaluations done in respect of the trainee, and

(c) if, at the end of the training period, the trainee's falling activity meets a standard acceptable to the Board, verify in writing that the trainee has demonstrated the competence necessary for certification under subsection (5).

(5) If all of the requirements of subsections (1), (2) and (4) are satisfied in respect of a worker who is a trainee faller, a person acceptable to the Board may certify in writing that the worker is a competent faller.

manner acceptable to the Board and a copy of that record must be made available to an officer or the trainee to whom the record pertains.

(7) Subsection (2) does not apply to a worker who satisfies all of the following requirements:

(a) the worker has performed falling duties regularly for at least 2 years before the evaluation under paragraph (b) of this subsection takes place;

(b) the worker's falling activity is evaluated by a qualified supervisor or trainer and it meets a standard acceptable to the Board;

(c) in the presence of a qualified supervisor or trainer, the worker passes a written or oral examination on falling;

(d) the worker is certified in writing as a competent faller by a person acceptable to the Board.

(8) For the purposes of subsection (7) (b), the qualified supervisor or trainer must

(a) keep a record of the evaluation, and

(b) verify in writing that the worker has demonstrated the competence necessary for certification under subsection (7) (d).

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.22.1 Falling supervisors for forestry operations

(1) A qualified supervisor must be designated for all falling and associated bucking activities in a forestry operation.

(2) The supervisor designated under subsection (1) must

(a) ensure that the falling and bucking activities are planned and conducted in accordance with this Regulation,

(b) inspect the workplace of each faller at time intervals appropriate to the risks, and

(c) keep a record of every inspection conducted under paragraph (b).

(3) The supervisor designated under subsection (1) must not undertake or be assigned activities which interfere with performance of the supervisor's duties under subsection (2).

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.23 Procedures for falling and bucking

(1) In this section and in section 26.24, **"brushing"** means the striking of a standing tree by a tree being felled if the strike is a direct blow or a glancing blow of sufficient force to cause one or more branches to break at or near the stem of the standing tree.

(2) Fallers and buckers associated with falling activities must be provided with and follow written safe

work practices acceptable to the Board for the type of work activity they perform, including procedures for the following:

(a) establishing minimum and maximum distances between fallers and other workers;

(b) planning and constructing escape routes;

(c) controlling the fall of trees;

(d) minimizing unnecessary brushing;

(e) dealing with dangerous trees;

(f) bucking trees and logs;

(g) using mechanical assistance to fall trees;

(h) summoning and rendering assistance to manage a falling difficulty or to deal with an emergency;

(i) conducting special or innovative harvesting techniques;

(j) ensuring the well-being of each faller and bucker at least every half hour and at the end of the work shift.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.24 Responsibility for falling and bucking

(1) Subject to section 26.29 (3), before a tree is felled, all workers must be clear of the area within a 2 tree-length radius of the tree.

(2) Before falling or bucking starts, all obstructions to the activity must be cleared and a safe escape route to a predetermined safe position must be prepared.

(3) A tree must not be felled if it could strike any stationary or running line of any operational equipment.

(4) If it is necessary to pack or shovel snow to reduce stump height, the depth of the depression at the base of the tree must not exceed 45 cm (18 in.).

(5) The falling of a tree must be conducted in accordance with the following procedures:

(a) a sufficient undercut must be used;

(b) the undercut must be complete and cleaned out;

(c) sufficient holding wood must be maintained;

(d) the backcut must be higher than the undercut to provide a step on the stump;

(e) wedging tools must be immediately available and, unless the tree has a pronounced favourable lean, wedges must be set.

(5.1) When a tree is being felled, the tree must not brush standing trees if that can be avoided.

(6) A tree must not be used to cause another partially cut tree to fall in succession unless

(a) it is necessary to do so to overcome a specific falling difficulty, and

(b) the succession falling is done in accordance with subsection (6.1).

(6.1) The following apply for the purposes of subsection (6):

(a) only one tree may be used to cause another partially cut tree to fall in succession;

(b) only those trees necessary to deal with the falling difficulty referred to in subsection (6) are partially cut;

(c) a wedge is driven into the backcut of each partially cut tree.

(7) When a tree starts to fall, the faller and any other worker present must move quickly to a predetermined safe position, at least 3 m (10 ft) away from the base of the tree where possible, and take cover if available.

(8) All workers must be clear of the hazard area before a tree or log is bucked.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.25 Dangerous trees and logs

(1) Falling or bucking must not be started if

(a) a tree or log is in a condition that, if felled or bucked in that condition, the tree or log would pose a reasonably foreseeable risk to a worker, or

(b) it appears that the tree cannot be completely felled or the bucking cut cannot be completed, as the case may be.

(2) If for any reason a partially cut tree cannot be completely felled and must be bypassed or left unattended, then the following apply:

(a) the tree must be clearly marked;

(b) work, other than that necessary to complete the falling of the tree, must stop in the hazard area until the tree is felled;

(c) any worker who could enter the hazard area must be alerted to the hazard;

(d) the supervisor for that falling activity must be notified.

(3) The supervisor referred to in subsection (2) (d) must ensure that

(a) all workers at risk are notified, and

(b) the tree is safely felled before other work is undertaken in the hazard area.

(4) If a bucking cut cannot be completed and the partially bucked log must be bypassed or left unattended, then the following apply:

(a) if possible, a distinct cross must immediately be cut or marked on the top of each end of the log;

(b) the supervisor for the bucking activity must be notified at the end of the work day;

(c) the supervisor for the bucking activity must notify all workers at risk.

(5) Subsections (2) to (4) do not apply if the incomplete falling or bucking is part of a planned process in which safe work practices acceptable to the Board are implemented.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.26 Falling dangerous trees

(1) Where practicable, dangerous trees must be felled

(a) progressively with the falling of other timber but before falling adjacent live trees, and

(b) into open areas.

(2) When falling a dangerous tree,

(a) dangerous bark must be removed, where practicable,

(b) stump height must, in the judgment of the faller, allow maximum visibility and freedom of action,

(c) the tree must be felled in the direction of lean whenever possible, and the undercut must be as deep as necessary to minimize the use of wedges and resulting vibration,

(d) pushing with a green tree must only be undertaken to overcome a falling difficulty, and

(e) wedging over must be used only if there is no alternative, and after a careful assessment of the ability of the dangerous tree to withstand wedging.

(3) If conventional methods cannot be safely employed to fall a dangerous tree, blasting or other acceptable methods must be used.

(4) Falling, bucking or limbing activities must not be undertaken in an area made hazardous by a dangerous tree, or a dangerous tree which has been brushed by a felled tree, until the dangerous tree has been felled.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.27 Location of fallers

(1) Fallers and buckers must not work in a location where they or other workers could be endangered by that work.

(2) If an elevation or steep slope poses a risk to a faller, the faller must be provided with and use an

appropriate fall protection system.

(3) Any fall protection provided under subsection (2) must not impede the ability of the faller to move to a predetermined safe position as required in section 26.24 (7).

(4) A faller must not work in a location where the faller is supported solely by a lifeline and harness.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.28 Summoning assistance

(1) Qualified assistance must be readily available to fallers in case of difficulty, emergency or injury.

(2) Fallers and buckers must have an effective means to summon assistance.

26.29 Entry to falling area

(1) Only a worker with duties associated with the falling activity may enter an active falling area.

(2) Before entering the active falling area, workers must notify the faller or bucker and wait until advised by the faller or bucker that it is safe to enter.

(3) A worker, in addition to the faller, may be at the base of a tree being felled if the worker is

(a) supervising or directing the falling activity,

(b) training as a faller, or

(c) required to assist the faller to overcome a specific falling difficulty.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

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26.29.1 Application

Sections 26.29.2 to 26.29.5 apply only to mechanical falling activities.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.29.2 Limits on use of mechanical harvester

(a) the tree is in a condition that, if felled in that condition, it would pose a reasonably foreseeable risk to the harvester operator, or

(b) the mechanical harvester is not capable of falling the tree safely.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.29.3 Incomplete falling cuts

(1) If a partially cut tree cannot be completely felled by a mechanical harvester and must be bypassed or left unattended, the following apply:

(a) the tree must be clearly marked;

(b) work, other than that necessary to complete the falling of the tree, must stop in the hazard area until the tree is felled;

(c) any worker who could enter the hazard area must be alerted to the hazard;

(d) the person responsible for the direction and control of the mechanical harvesting activity must be notified.

(2) The person referred to in subsection (1) (d) must ensure that

(a) all workers at risk are notified, and

(b) the tree is safely felled before other work is undertaken in the hazard area.

(3) Subsection (1) does not apply if incomplete falling is part of a planned process in which safe work practices acceptable to the Board are implemented.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.29.4 Hazard area

(1) Only a worker with duties associated with a mechanical falling activity may enter the active falling area.

(2) Before a tree is felled by a mechanical harvester, all workers and equipment, other than the equipment operator and the harvesting equipment, must be clear of the area within a 2 tree-length radius of the tree.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.29.5 No additional hazards

Mechanical falling activities must be conducted in a manner that does not create any additional hazard for workers conducting subsequent work activities.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

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26.30 Traffic control

If, in any type of falling activity, a tree being felled may create a hazard to a user of a road, effective traffic control must be used to stop or control approaching traffic.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

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26.31 Equipment construction

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

26.32 Operator protection

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.33 Mobile yarders

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.33.1 Application

Sections 26.34 to 26.55 apply only to forestry operations.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.34 Signalling

(1) Only a designated worker may signal for the movement of cable yarding equipment, but any worker may signal to stop cable yarding equipment, and that signal must be obeyed promptly.

(2) The worker designated to signal the yarder operator must

(a) not be otherwise occupied while the equipment is in motion, and

(b) not signal for the movement of the equipment until assured that no workers are endangered within the area for which the designated worker is responsible.

(3) The signals for rigging movement must be clearly discernible to the equipment operator, and to all workers who could be endangered by the movement of the equipment.

(4) A worker who directs or operates equipment, or who could be endangered by the movement of equipment, must be familiar with the meaning of the signals.

(5) The equipment operator must stop the equipment if a signal is not clearly understood.

(6) If voice signals are being used that cannot be heard by workers who could be endangered by the movement of equipment, the equipment operator must not move the equipment until the operator has given a signal by means understandable to all those workers.

(6.1) If voice signals are being used to direct the operation of a grapple yarder, the signals specified in Table 26-8 must be used.

(7) If non-verbal signals such as whistles and hand signals are used to direct the operation of equipment, the signals specified in Tables 26-1 to 26-7 must be used.

(8) When audible signals are being used concurrently to direct the operation of more than one piece of equipment, the signal tones must be differentiated to clearly identify intended movement of each machine.

(9) Signalling devices must be tested at the start of each shift in a way that ensures that equipment will not be moved in response to the test.

(10) Defective signalling devices that might cause a hazard to workers must not be used, and repairs, alterations, or adjustments to signalling devices must be performed by qualified persons.

(11) A radio signalling device used to direct the movement of logging equipment must be designed, maintained and operated in accordance with a standard acceptable to the Board.

(12) Any signalling system using radio frequency transmission must operate on a frequency and at a transmission power assigned and coordinated by a person acceptable to the Board.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.35 Radio controlled machines

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.36 Climbing equipment

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.37 Hoisting workers

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.38 Riding on rigging

(1) Subject to subsection (2), a worker must not be transported on any cable system unless

(a) the system is authorized for use in a rescue, an emergency, an inspection or maintenance and it is being used for that purpose,

(b) all other means for transportation are impracticable, and

(c) the system is capable of withstanding the loads and stresses to be placed on it.

(2) Subsection (1) does not apply if the system is designed

(a) by a professional engineer, and

(b) for the purpose of the transport of workers.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.39 Safe location

(1) A worker must not be positioned within the bight of any running line under tension, nor in a position where the worker could be struck by a line if it were to break or come loose, or be tightened if slack.

(2) A worker must be positioned in the clear to avoid being exposed to moving logs, saplings, root wads, chunks, rigging or other material.

(3) A worker must be positioned clear of rigging which is stopped by an obstruction until the rigging has been slackened to reduce the hazard.

(4) Despite subsection (1), a worker may enter the bight of a slack line to deal with an obstruction or set chokers.

(5) If a worker enters the bight of a running line pursuant to subsection (4), the rigging must not be tightened until a clear go-ahead signal has been given by the worker.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.39.1 Removal of potential hazards to rigging

(1) A tree must be felled if the tree could

(a) interfere with rig-up or with movement of lines and yarding equipment, or

(b) be pushed or pulled into an area where a worker is working.

(2) Saplings over 6 m (20 ft.) tall that

(b) constitute a reasonably foreseeable risk to workers must be felled before yarding activity begins.

(3) If it is not practicable to comply with subsection (2), safe work practices acceptable to the Board that eliminate or minimize the risk to workers in the forestry operation may be used if these safe work practices are directed by a supervisor.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.40 Anchors

(1) A standing tree may be used for anchoring lines or fastening blocks only if

(a) a suitable stump is not available, and

(b) the tree is effectively tied back to another anchor, except that a secondary anchor tree need not be tied back.

(1.1) A standing tree must not be used to anchor guylines if a worker would be endangered were the tree to be pulled over.

(2) A stump or tree must not be used as an anchor for a line or for fastening a block until it has been determined that it is suitable for use as an anchor, and it must be inspected daily to determine that it remains suitable for continued use.

(2.1) An anchor to which a haulback block is attached must have a notch of sufficient depth to retain the strap or must provide equivalent security by other effective means.

(3) Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

(4) Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

(5) If a log, pipe or other apparatus buried in the ground is used to anchor a guyline or skyline, the method and equipment used must be acceptable to the Board and

(a) the guyline or skyline must not be directly attached to the anchor,

(b) a suitable strap or line of equal size and strength to the guyline or skyline with eyes in each end must be used, with one wrap around the anchor, and both eyes attached to the guyline or skyline with a shackle, and

(c) the eye connection of the anchor strap must be visible for inspection.

(6) Any anchor system not otherwise referred to in this section must be used in accordance with

(a) its design specifications and manufacturer's recommendations, or

(b) if those specifications or recommendations are not known, a method acceptable to the Board.

(7) Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

(8) If an anchor system has 2 or more legs, bridle blocks of adequate strength must be used to distribute

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.41 Guylines

(1) Guylines for a mobile yarder must be positioned

(a) as specified by the manufacturer, or

(b) in a manner acceptable to the Board.

(2) Guylines must be rigged to provide a 45 degree or larger angle between the guyline and a line drawn plumb through the guyline fairlead.

(3) If it is not practicable to comply with subsection (1) or (2), or if suitable anchors are not available, additional steps must be taken to ensure the stability of the yarder.

(4) Guylines must be attached to the supported structure by guyline shackles, or other fastenings providing equivalent security.

(5) Safety devices with breaking strength at least equal to that of the guylines must be installed at the top of mobile spars to prevent guylines or their assemblies from falling.

(6) Guylines over a travelled road must be rigged to clear all traffic, or if this is not practicable,

(a) the guylines must be conspicuously marked, and

(b) signs warning of limited clearance must be posted on the road.

(7) A guyline must be secured to its anchor stump in the following manner:

(a) a notch of sufficient depth, or another means of equivalent security, must be used to retain the wrapping lines;

(b) sleeve shackles, knob and bell, screwy hooks or line clamps compatible with the guyline size must be used.

(8) If spikes are used to secure a guyline to an anchor stump, there must be at least

(a) 8 spikes in the first wrap, 3 spikes in the second wrap and 8 spikes in the last wrap if the guyline is attached to the yarder, or

(b) 3 spikes in the last wrap if the guyline is attached to a back spar.

(9) If spikes are used to secure a guyline to an anchor stump, there must be a minimum of 2 1/2 wraps of the guyline around the anchor stump.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

Figure 26-1 Positioning guylines for mobile yarders

Repealed [B.C. Reg. 20/2008, effective May 1, 2008.]

26.42 Rigging

(1) Rigging must be of a type and size for which the equipment is designed.

(2) Lines, blocks, and yarding and loading equipment must be rigged in accordance with accepted industry standards.

(3) Shackle pins on stationary lines must be secured with molly hogans or other acceptable means to prevent accidental dislodgement.

(4) Molly hogans must not be used to connect skylines, loading rigging, or any stationary lines.

(5) Screw pin shackles used on running lines must be tightened securely and routinely inspected.

(6) Rigging must be inspected at regular and frequent intervals by a qualified worker.

26.43 Supporting blocks

Straps for supporting blocks must

(a) be made from wire rope or synthetic fibre material, and

(b) be of sufficient size and condition to withstand the maximum anticipated loads.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.44 Winches

(1) When properly anchored to a winch, the minimum number of wraps of cable left on a winch drum must be

(a) for skylines, 1 1/2 layers, and

(b) for other types of logging equipment, 3 complete wraps.

(2) Subsection (1) does not apply to a skidding winch mounted on ground-based skidding equipment.

26.45 Prohibition of knots

A knot must not be used in any winch line or other rigging, except

(a) to effect temporary repair in the event of line breakage, or

(b) for tag lines on grapple log loaders or for hooks on strawline eyes.

26.46 Skyline anchors

(1) A skyline must be anchored to

(b) the base of a standing tree if the tree is tied back to a secondary anchor, or

(c) a suitable piece of mobile equipment.

(2) A skyline must be secured to an anchor by

(a) a choker using a large sleeve-type knockout pin shackle or an approved safety pin-type shackle over the skyline with the pin through the eye,

(b) a strap acceptable to the Board, with both eyes hung in a shackle and the knockout pin or safety pin through the eye of the skyline, or

(c) a wire rope clip system meeting the requirements of Part 15.

(3) If anchor stumps in standing timber are used for slackline or other skyline operations, the skyline must be prevented from striking trees in the area, or the trees must be felled.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.47 Skyline extensions

If a skyline extension is used

(a) the breaking strength of the extension must be greater than or equal to that of the skyline,

(b) the extension must not alter the safe capacity of the tower, and

(c) if the carriage runs over it, the extension must be attached by a regular long splice or by a flush pin straight side shackle connecting the 2 eyes.

26.48 Skyline spars

(1) Each skyline spar must be of adequate strength.

(2) An intermediate spar must be used in a manner acceptable to the Board.

(3) Backspars must be topped unless workers are prohibited from entering the hazard area created when the skyline is loaded.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.49 Skyline rigging

(1) When rigged in a backspar, a skyline must be anchored no more than 8° off-line from the rearward projection of the skyline.

(2) If a suitable anchor cannot be found to comply with subsection (1), another suitable anchor may be used provided that the backspar is stabilized by extra guylines.

(3) The rearward projection of the skyline must

(a) not be considered a guyline, and

(b) not make an angle greater than 50° measured from the horizontal as it leaves the backspar unless approved by a professional engineer.

(4) The method used to support a skyline at a backspar or intermediate spar must provide adequate support and protection for the line.

(5) A skyline must not be fastened directly to a backspar.

26.50 Backspar guylines

(1) A tree used as a backspar must be guyed with a sufficient number of guylines to ensure that the tree is adequately supported.

(2) If spikes are used to anchor a backspar guyline

(a) the guyline must have at least 2 1/2 wraps around the stump, and

(b) three spikes must be placed in sound wood on the last wrap.

(3) Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.51 Lift trees

A lift tree must be topped or guyed unless

(a) the tree is of adequate strength to withstand the loads that are placed on it during yarding activities,

(b) the lines run through tail-hold blocks located so as to minimize stress on the tree, and

(c) tail-holds are rigged and located to prevent a worker from being endangered if the tree is pulled over.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.52 Corridor logging

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

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26.53 Ground skidding operations

Ground based skidding operations must be conducted using safe work practices acceptable to the Board, including, without limitation, the following:

(a) not winching at an angle that could cause an obstruction to upset the equipment;

(b) to avoid obstruction hang-up and rollover, if practicable, winching the turn up tight to the equipment before the equipment is moved;

(c) selecting a suitable gear to maintain control of the equipment before climbing or descending grades;

(d) dropping the turn to free the log if an unchoked log is picked up with a turn;

(e) avoiding abrupt turns of equipment on side hills.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.54 Equipment stability

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.55 Mainline release

A skidding winch on a ground based skidding machine must have a quick-release system to permit the winch line to run out freely and automatically disengage from its drum.

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26.56 Work area arrangement

(1) In this section, **"work area"** includes any area in which any forestry work is done but does not include the travelled portion of a road unless that portion of the road is being used as a landing.

(2) Work in a work area in a forestry operation must be planned and the work area must be located, constructed, maintained and operated to ensure the following:

(a) logs can be moved safely in the area;

(b) log piles and equipment used to handle the logs do not become unstable or otherwise create a hazard;

(c) workers are able to work in locations clear of moving logs and equipment;

(d) workers are not exposed to incoming or runaway logs or other debris;

(e) the area is kept free from buildup of bark and other debris to the extent that it would pose a risk to workers;

(f) an effective method of dust control is used and maintained.

(3) Log piles must, to the extent practicable, be located on stable and relatively level ground.

(4) Log piles must not be higher than the safe operating reach of equipment being used to handle the logs.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.57 Equipment locations

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.58 Limbing and bucking restrictions

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.59 Suspended logs

(1) A log must not be passed over any worker or occupied vehicle or equipment.

(2) Despite subsection (1), a log may be passed over a vehicle or equipment that is being loaded, if the log

(a) does not pass over any portion of the vehicle or equipment that is occupied by a person, and

(b) does not constitute a hazard for the occupant of the vehicle or equipment.

(3) A worker must not stand or pass under a suspended log.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.60 Log handling equipment

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.61 Vehicle movements

(1) Effective means of communication must be used in a forestry operation to control vehicle movements in any location where

(a) a loader operator is unable to see the loading operation, or

(b) trucks are moving at landings, load-out points, water dumps, dry land sorts or railway reloads.

(2) If, for the purposes of subsection (1), audible signals are used as the means of communication, the

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.62 Maintenance

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.63 Unauthorized persons

Only persons permitted by by law or by the workplace safe work procedures may be at landings, load-out points, water dumps, dry land sorts and railway reloads.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.64 Bunk and stake assemblies

Bunk and stake assemblies, installed at a dry land sort for bundling logs, must have fixed stakes or be used with safe work procedures which ensure that no worker goes into the hazard area adjacent to or below self-tripping stakes unless the stakes are secured from releasing.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

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26.65 Cab guard

(1) In this section:

"cab guard" means a barrier guarding the back of the cab of a log transporter;

"certified welding inspector" means a person who is certified as a Level 2 or Level 3 welding inspector in accordance with *CSA Standard W178.2-08 (R2013), Certification of Welding Inspectors*;

"rated capacity", in relation to a cab guard, means the maximum cargo weight that may be transported by the log transporter and shift and contact the cab guard such that the cab guard is capable of withstanding a horizontal forward static load equal to 40% of that cargo weight, with this load uniformly distributed over the entire cab guard.

(2) For the protection of the driver of a log transporter, the log transporter must have a cab guard that meets all of the following requirements:

(a) subject to subsection (3), the cab guard is at least 15 cm (6 in) higher than the cab;

(b) the cab guard is at least as wide as the cab;

(c) the cab guard has no opening large enough to permit any item of cargo to pass through it;

(d) the cab guard is

(i) constructed with a main supporting structure made of steel, or

(ii) certified by a professional engineer as having a main supporting structure designed and constructed so that vibration and distortion generated by use of the log transporter cannot damage the cab guard;

(e) the cab guard is installed in a manner that ensures that the rated capacity of the cab guard is not diminished.

(3) The cab guard of a self-loading log transporter may be less than the height specified in subsection (2) (a) but must not be less than the cab height.

(4) The weight of cargo that is being transported by a log transporter and that may shift and contact the cab guard must not exceed the rated capacity of the cab guard.

(5) The operator of a log transporter must record the results of the inspection, made before the start of operation on the shift, of the cab guard of the log transporter.

(6) A log transporter must be removed from service if there are any cracks, damage or other conditions that will decrease the rated capacity of the cab guard of the log transporter.

(7) A log transporter removed from service under subsection (6) must not be returned to service until

(a) the cab guard is

(i) repaired, and

(ii) inspected and certified to meet the rated capacity by the manufacturer, a professional engineer or a certified welding inspector, or

(b) the cab guard is replaced by a cab guard that meets the requirements of this section.

(8) The cab guard of a log transporter must be

(a) permanently marked with

(i) the name and address of its manufacturer,

(ii) the model number or serial number of the cab guard, and

(iii) the rated capacity of the cab guard, or

(b) identified by carrying in the log transporter a copy of a letter that

(i) accurately describes the barrier cab guard,

(ii) certifies the model number or serial number of the barrier cab guard and the rated capacity of the cab

(iii) has been signed by the manufacturer or a professional engineer.

[Enacted by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg 73/2005, effective February 25, 2005.]

[Amended by B.C. Reg. 18/2006, effective May 17, 2006.]

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

26.66 Bunks and stakes

(1) Trucks, trailers and semitrailers used for transporting logs must be equipped with bunks and stakes of adequate design and construction to safely perform their intended function.

(2) Bunks must be able to rotate freely upon their pivots, if designed to do so.

(3) Stakes, extensions and stake lines must be installed and maintained to ensure that when the log transporter is loaded

(a) the angle between the bunks and stakes at the base does not exceed 90°, and

(b) the angle between the bunks and the stakes and extensions above the base does not exceed the angle at which the stakes and extensions can safely withstand the maximum anticipated loads.

(4) Stakes must be constructed so that

(a) they can be released only from the opposite end of the bunk,

(b) keeper pins are secured against unintended release, and

(c) if they are over 1.2 m (4 ft) in height, springs or other mechanical means are fitted to facilitate their returning to a vertical position.

(4.1) A worker must not go on bunks and trailer assemblies to raise or lower stakes and extensions unless it is impracticable to do otherwise.

(4.2) If a worker must go on a bunk or trailer assembly to collapse stakes or extensions, the worker must be provided a safe means of getting on and off the bunk or trailer assembly.

(4.3) Procedures must be developed and implemented for collapsing stakes or extensions during adverse weather conditions.

(5) Stake extensions must be secured against inadvertent detachment from the stakes.

(6) Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

(7) Stake lines must

(a) not be made from swaged wire rope, and

(b) conform to the following specifications:

Bunk width		Stake line minimum diameter	
metres	feet	**millimetres**	inches
up to 2.6	up to 8 1/2	**22**	7/8
2.6 to 3.7	8 1/2 to 12	**29**	1 1/8
over 3.7	over 12	**32**	1 1/4

(8) Stake and bunk assemblies must be inspected daily, and must not be used if they show signs of excessive wear.

(8.1) A record of all inspections conducted under subsection (8) must be maintained.

(9) Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

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

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.67 Load specifications

(1) In order to control the movement of a log transporter while it is being loaded, an effective means of communication must be established between the transporter operator and any worker loading the logs.

(1.1) Logs must not be loaded on a log transporter unless all workers in the vicinity are in a safe location and clear of any moving logs or logs that might move or fall during that operation.

(1.2) While a log transporter is being loaded, a worker must not stand on the cab platform of the transporter or between the transporter cab and a log being loaded.

(1.3) Logs must be loaded on a log transporter in a manner that meets all of the following requirements:

(a) the load must be stable without the use of binders;

(b) the transporter and the load must remain stable while in transit;

(c) the strain on the binder units, bunk stake lines or stakes must not exceed the load that the units, lines or stakes are designed to bear;

(d) the free and full movement of the transporter must not be impaired.

(2) To ensure that stakes remain at a safe angle, the first tier of logs must be laid tight, and arranged to minimize slack in the stake cables.

(3) Unless securely restrained by other means to prevent logs from slipping off, the bottom tier and the side rows of the log load must extend beyond the front and rear bunks and stakes

(a) at least 30 cm (12 in) on trucks with compensating reach type trailers, or

(b) at least 15 cm (6 in) on other types of trailers.

(4) The log length on a log transporter must not exceed the design capacity of the road.

(5) A log whose length is not contained by the stakes must not be loaded above the level of the stakes unless the log

(a) is in a secure lay, and

(b) does not have excessive crook, sweep or deformity.

(5.1) Hazardous limbs must not be transported on a log transporter.

(5.2) A worker must not stand on any part of a load of logs on a log transporter.

(6) Repealed [B.C. Reg 313/2001, effective March 27, 2002.]

[Amended by B.C. Reg 313/2001, effective March 27, 2002.]

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.68 Binders

(1) Unless the centres of all logs lie below the level of the top of the stakes on a log transporter, at least 2 binders must be installed to restrain the logs before the transporter is moved.

(1.1) If the logs are preloaded onto a trailer, the binders required under subsection (1) must be installed immediately after the loading and before the trailer is connected to the tractor of the logging truck.

(2) A loaded log transporter may be moved within the loading area without the binders required under subsection (1) if no worker is exposed to the risk of a falling log or other falling debris.

(3) If logs or log chunks could roll or slide off the log transporter, or the logs or log chunks are not contained within stakes, at least 2 binders must be used to secure the logs regardless of the height of the load.

(3.1) All binders that must be in place before a load of logs may be transported must be put on

(a) as soon as practicable after loading, and

(b) in a location in close proximity to the loading area.

(3.2) Loads or logs must not be moved or shifted while binders are being applied or adjusted.

(3.3) A binder on a load of logs must be checked and kept tight during transportation of the logs.

(4) Each binder and attachment must have a breaking strength of at least 53 kN (12,000 lbs).

(5) Bundle straps or banding must not be used as binders to restrain logs during hauling.

(5.1) Subsection (5) does not apply in a loading area if no worker is exposed to the risk of a falling log or other falling debris.

(6) Binders must be positioned on the load so that the number of binders required while the load is

equipment is in position.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.69 Binder removal

(1) In this section, *"binder removal station"* means a structure that is designed to protect a worker, when releasing binders or stakes, from the maximum anticipated load of falling or sliding logs or log chunks.

(2) Written safe work procedures acceptable to the Board must be developed for

(a) removing binders, and

(b) the use of a binder removal station.

(3) The written procedures developed under subsection (2) must be

(a) posted in a visible location at any place where binders are removed, including a binder removal station, and

(b) maintained in a legible condition.

(4) Binders must not be removed when a worker is preparing to unload logs from a log transporter unless

(a) a binder removal station is being used, or

(b) the logs are otherwise restrained to prevent them from falling on the worker who is releasing the binders or stakes.

(5) Once binders have been removed from a load of logs, the unrestrained load must not be moved if any worker is exposed to the risk of a falling log or other falling debris.

(6) A binder removal station must not be used unless it is certified by a professional engineer as capable of performing its intended function.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

[Amended by B.C. Reg. 20/2008, effective January 1, 2009.]

26.70 Unguarded equipment

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.71 Operating provisions

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.71.1 Operating procedures

(1) The operator of a log transporter must follow safe operating procedures

(2) Without limiting subsection (1), the operator referred to in subsection (1) must

(a) not overtake another moving industrial vehicle, except on a signal from the other vehicle operator,

(b) use extreme caution when approaching vehicles coming from the opposite direction,

(c) keep a safe distance when following crew transportation vehicles, having due regard for road and grade conditions and visibility,

(d) drive at a speed appropriate to the log transporter's capabilities, the road design and condition, the traffic, the visibility and the weather conditions, and

(e) not operate the log transporter while impaired by

(i) fatigue, or

(ii) any other cause, substance or matter

that could prevent the operator from operating the log transporter safely.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.71.2 Daily log

(1) In this section, *"hauling cycle"* means the time allowed for each round trip.

(2) The operator of a log transporter must maintain a daily log into which must be entered the following information:

(a) the date of the entry;

(b) the printed name of the operator;

(c) the truck licence plate or unit number;

(d) the odometer reading of the truck at the beginning of the day, if the truck has an odometer;

(e) the name of each contractor or employer for whom the operator worked during the day;

(f) the start and stop time of each trip the operator makes;

(g) the distance driven for each trip the operator makes;

(h) the total distance driven by the operator during the day;

(i) the total driving hours during the day;

(j) the hauling cycle.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

A log transporter must be equipped with a horn or whistle which, under normal conditions,

(a) is distinctly audible at a distance of 300 m (1,000 ft), and

(b) has a tone distinct from the whistles used by yarders or loaders in the vicinity.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.73 Non-slip steps

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.74 Restriction

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.75 Riders

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.76 Securing trailers

(1) Empty log transporter trailers, when loaded onto tractors, must be adequately secured against dislodgement.

(2) Handholds or other suitable facilities must be installed on trailer or semi-trailer reaches if workers are required to manually assist in coupling them to tractors.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.77 Assistance on steep grades

If the braking power of equipment is insufficient to provide adequate control on a slope, the vehicle must be snubbed or assisted.

26.78 Transporting workers

An operator of a vehicle transporting workers in a forestry operation on a road must not overtake and pass a moving and loaded log transporter or low bed transport truck, unless

(a) that operator receives a signal to proceed from the operator of the loaded log transporter or the operator of the low bed transport truck, and

(b) the road conditions are suitable for that manoeuvre.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

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Roads and Road Maintenance

26.79 Haul road standards

Roads, bridges, elevated platforms, and other structures used by vehicles transporting workers, logs or other forest products in forestry operations must be constructed and maintained to a standard which will permit safe transit.

26.80 Creating additional hazards

Road or skid trail construction, including any blasting activity, must be carried out in a manner that prevents hangups, hanging broken tops or limbs, leaners, sidebind of pushed trees, or similar hazards which could endanger fallers or other workers.

26.81 Bull rails

The open sides of bridges, elevated truck weigh scales and associated elevated ramp approaches, and other elevated structures used by logging trucks must be equipped with substantial and well secured continuous timber or log curbs or bull rails of sufficient height to prevent vehicles from running off the structure, but not less than 25 cm (10 in).

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

26.82 Roadside hazards

(1) Dangerous trees, loose rocks, stumps, or other unstable materials that are hazardous to road users must be removed or cleared for a safe distance back from roadsides or roadside banks.

(2) Brush, foliage or debris which prevents an adequate view by a vehicle operator of traffic approaching at roadway intersections or on sharp curves must be cleared and all possible precautions must otherwise be taken to control the hazards created by limited sight distance.

26.83 Traffic control systems

(1) An effective traffic control system must be used by all vehicles on a section of road that is too narrow to permit 2 or more vehicles to pass.

(2) The traffic control system must include

(a) turnouts, where required,

(b) vehicles operating with their headlights and, if fitted, flashing beacons, turned on,

(d) instructional signs, including kilometre and road name or number signs.

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]

26.83.1 Radio traffic control

Instructional signs must be posted showing

(a) radio channels on a road or a section of a road where radio channels are being used for traffic control, or

(b) radio frequencies on a road or a section of a road where radio frequencies, but not radio channels, are being used for traffic control.

[Enacted by B.C. Reg. 312/2012, effective February 1, 2013.]

26.84 Weigh scales

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

(2) Weight recording house structures, forming part of a log transporter weigh scale unit, must

(a) be sufficiently offset from the scale balance platform to provide an adequate margin for log load clearance, or

(b) have an effective barrier erected between the weigh scale deck and the house.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

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26.85 Condition of boats

(1) A boat used in or about a forestry operation must be maintained in good mechanical and seaworthy condition.

(2) A boat must be inspected daily before first use, and thereafter as required, and defects must

(a) be reported immediately in writing to the supervisor, and

(b) if they affect the safe operation of the boat, be remedied before the boat is used.

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

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.86 Boat equipment

(1) A boat must be equipped with

(a) effective machinery guarding that meets the requirements of this Regulation,

(b) effective guards or insulation on hot exhaust pipes or stacks,

(c) suitable cabins, screens or guards to protect operators against injury from towline breakage if the boats are regularly required to pull logs, booms or barges,

(d) suitable cabins, screens, or guards meeting the requirements of *WCB Standard G606, Boom Boat Operator Protective Structures* if operators are subject to injury from logs or limbs intruding into the control area,

(e) suitable hydraulic or other steering systems that will not transmit forces that could cause injury to the operator through feedback of rudder reaction,

(f) deck matting or other surface cover which provides an effective grip for caulked footwear, and

(g) effective heating.

(2) A boat operated in navigable waters during the period from sunset to sunrise, or in conditions of restricted visibility, must

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

(b) have deck and cabin lighting, where necessary to provide safe levels of illumination aboard the craft, and

(c) have searchlights or floodlights, where necessary to facilitate safe navigation and to illuminate working or boarding areas adjacent to the craft.

(3) Buoyancy equipment meeting the requirements of Part 8 (Personal Protective Clothing and Equipment) must be worn by each worker on a boom boat or in an open boat.

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

* See also section 4.4 of the OHS Regulation.

26.87 Boat size

(1) A boat used for breaking down unstable groups of logs which are criss-crossed or difficult to break free must be of sufficient size to ensure that vessel stability is not compromised.

(2) A boat must not be used to tow log booms or barges, that, by reason of weight, wind, current or sea conditions, are beyond the capacity of the towing craft to safely control.

26.88 Overloading

A boat must not be loaded with personnel or equipment so as to adversely affect its stability or seaworthiness.

26.89 Presence of operator

When a boat is used to push, pull or restrain log bundles during breaking operations, the operator must remain on the boat unless the boat is firmly secured to the log bundles in a manner that allows the operator to get on and off safely.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.90 Wind and sea conditions

A boat designed for use in calm waters must not be operated in wind or sea conditions that adversely affect its safe operation.

26.91 Hand signals

If the movement of a boat is regulated by hand signals, the code of signals authorized by the Board must be followed.

26.92 Elevated work platforms

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

26.93 General requirements for booming

(1) Log booms must be made up and sized with due regard for the size and quality of the available rigging.

(2) Booming grounds must be of sufficient width to safely accommodate booms that are being worked on.

(3) Booming grounds must be provided with safe access.

[Amended by B.C. Reg. 20/2008, effective May 1, 2008.]

26.94 Rigging

(1) Booming chains, swifters and related items of rigging used in booming operations must be maintained in safe condition.

(2) Rigging which is damaged or deteriorated enough to be a danger to workers must be removed from service.

(3) The owner of the facility receiving a completed log boom must ensure that boomsticks are

(a) stripped of excess rigging before they are returned into service, and

(b) secured in a manner that will prevent entanglement during transit.

Note: See Part 15 (Rigging) for general requirements related to rigging.

26.95 Winches

A boat that is used to make up or strip booms must use a winch appropriate to the task that

(a) is capable of withstanding the maximum stress that could be imposed while moving log bundles, and

(b) has a large enough diameter to hold all of the line that is needed to complete the task.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.96 Manual boom stripping

If boom stripping is done manually, a sufficient number of workers must be available to handle the rigging safely.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.97 Portable augers

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

26.98 Dumping log bundles

A log or log bundle must not be dumped into water if there is a known or reasonably foreseeable risk to a worker.

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

26.99 Rescue

Repealed. [B.C. Reg. 20/2008, effective May 1, 2008.]

Table 26-1: Audible call signals

7 LONG whistles	ACCIDENT
1 LONG whistle, continued until emergency condition has ceased to exist	EMERGENCY HAZARD CONDITION
1 LONG — several SHORT whistles, repeated	FIRE
1 LONG whistle (* also used by the equipment operator to indicate a delay and must also be given before the equipment is again operated)	STARTING WHISTLE

4 LONG whistles	CALLING SUPERVISOR
3 LONG whistles	CALLING HOOKER
3 LONG — several SHORT whistles	CALLING HOOKING CREW
2 LONG — 1 SHORT whistle	CALLING SECOND RIGGER
2 LONG — several SHORT whistles	CALLING SECOND RIGGER AND BACK RIGGERS
1 SHORT — 1 LONG whistle	CALLING FOR WATER BAG
* When an operating delay has occurred and the equipment is ready to re-operate, the signal immediately following the "one LONG" re-start signal must be the repeat instruction signal.	

Table 26-2: Audible signals for vehicle operations

1 whistle	STOP
2 whistles	BACK UP
3 whistles	GO AHEAD

Table 26-3: Audible signals for high lead logging

3 SHORT	AHEAD* ON MAINLINE
3 SHORT — pause — 1 SHORT	AHEAD ON STRAWLINE
2 SHORT — pause — 2 SHORT	BACK* ON HAULBACK
2 SHORT — pause — series of SHORTS	SLACK HAULBACK
Series of SHORTS	SLACK MAINLINE
1 LONG (precedes any signal for slow operation)	SLOW
1 SHORT	STOP ALL LINES
3 SHORT — pause — 2 SHORT	TIGHTLINE
2 SHORT	SLACK HAULBACK AND MAINLINE SIMULTANEOUSLY
3 SHORT — 1 SHORT	WHEN BUTT RIGGING AT TREE SEND OUT STRAWLINE ON HAULBACK
3 SHORT — pause — 1 SHORT — pause — 1 SHORT of each extension	WHEN BUTT RIGGING AT TREE SEND OUT STRAWLINE EXTENSIONS

2 SHORT — followed by a number of LONGS indicates the number of chokers required	WHEN BUTT RIGGING IS AT TREE SEND OUT CHOKERS
2 LONG	WHEN BUTT RIGGING IS AT TREE PUT ON/TAKE OFF SCAB BLOCK
5 SHORT	WHEN BUTT RIGGING IS AT TREE INSPECT THE RIGGING
2 SHORT — pause — 2 SHORT — pause — 2 SHORT — pause — 1 SHORT	TIGHTEN GUYLINE
2 SHORT — pause — 2 SHORT — pause — 2 SHORT	SLACK GUYLINE
* "AHEAD" means haulage line moves toward machine * "BACK" means haulage line moves away from machine	

Table 26-4: Audible signals for slackline logging

a) Regular Signals:	
1 SHORT — pause — 2 SHORT	AHEAD ON SKYLINE
3 SHORT	AHEAD ON SKIDDING LINE
2 SHORT — pause — 2 SHORT	COME BACK ON HAULBACK
3 SHORT — pause — 1 SHORT	AHEAD ON STRAWLINE
3 SHORT — pause — 2 SHORT	TIGHTLINE
1 SHORT	STOP
Several SHORT	SLACK SKYLINE
3 SHORT — pause — several SHORT	SLACK SKIDDING LINE
2 SHORT — pause — several SHORT	SLACK HAULBACK
b) Slow Signals:	
Any regular signal preceded by a LONG whistle is a slow signal. Any signal that the Engineer is not sure of is a "STOP" signal	
c) Miscellaneous Signals:	
3 SHORT — when carriage is going back	HOLD SKIDDING LINE TIGHT AND KEEP ON COMING BACK UNTIL 'STOP' SIGNAL IS RECEIVED
2 SHORT — when carriage is going back	HOLD SKIDDING LINE TIGHT, START LOWERING SKYLINE, KEEP ON COMING

A REPEAT — 2 SHORT	SLACK SKYLINE FASTER
2 SHORT — when carriage is going ahead	PICK UP ON SKYLINE
TIGHTLINE SIGNAL (3 SHORT — pause — 2 SHORT) when carriage is going ahead	SKIDDING LINE IS WRAPPED AROUND SKYLINE
When carriage is going back and "STOP" signal (one SHORT) comes in — Engineer stops carriage and starts lowering skyline. If a slack skidding line signal (three SHORT — pause — several SHORT) comes in while lowering the skyline, it means slack skidding and skyline at same time so that chokers come straight down.	
d) Signals to Chaser When Carriage is at Landing	
3 SHORT — pause — 1 SHORT	SEND BACK STRAWLINE ON HAULBACK
3 SHORT — pause — 1 SHORT followed by a number of evenly spaced SHORTS	SEND BACK THAT NUMBER OF COILS OF STRAWLINE
3 SHORT — pause — 1 SHORT – pause — 2 SHORT	SEND BACK END OF STRAWLINE HOOKED INTO CHOKER BELL FOR A DEAD LINE
2 SHORT — pause — a number of evenly spaced LONGS	SEND BACK THAT NUMBER OF CHOKERS
5 SHORT	INSPECT BUTT RIGGING

Table 26-5: Audible signals for mechanical slack pulling and drop line carriages on skyline yarders or running skyline yarders (as applicable)

a) Regular Signals:	
1 SHORT — pause — 2 SHORT	PICK UP SKYLINE
1 SHORT — pause — 2 SHORT — pause — several SHORTS	SLACK SKYLINE
2 SHORT — pause — 2 SHORT	COME BACK ON HAULBACK
1 SHORT — (when carriage is stopped by hooker then the machine operator automatically lowers chokers to ground by winding in slackpuller and paying out skidding line)	STOP ALL MOVING LINES
1 SHORT	STOP PULLING SLACK
5 SHORT	PULL SLACK AGAIN
1 SHORT — etc.	STOP PULLING SLACK
2 SHORT (this means HOLD haulback — slack the slackpuller — wind in skidding line)	PULL LOGS TO CARRIAGE

3 SHORT (this means wind in skidding line and slackpuller and pay out haulback)	AHEAD ON SKIDDING LINE (use interlock if available)
2 SHORT — pause — several SHORTS	SLACK HAULBACK
3 SHORT — pause — several SHORTS	SLACK SKIDDING LINE
3 SHORT — pause — 1 SHORT	AHEAD ON STRAWLINE
3 SHORT — pause — 1 SHORT — pause — several SHORTS	SLACK STRAWLINE
1 SHORT — pause — several SHORTS	SLACK SLACKPULLER
3 SHORT — pause — 2 SHORT (line is wrapped around skyline)	TIGHTLINE
b) Slow Signals:	
Any regular signal preceded by a LONG whistle is a slow signal. Any signal the machine operator is not sure of is a "STOP" signal.	
c) Miscellaneous Signals:	
When carriage is going ahead to landing	
2 SHORT	STOP CARRIAGE AND PULL LOGS UP CLOSER TO CARRIAGE
Several quick SHORTS	PICK UP SLACKPULLER FASTER
1 SHORT — pause — 2 SHORT	PICK UP SKYLINE
Signals to chaser when carriage is at landing	
5 SHORT	INSPECT THE RIGGING
2 SHORT — pause — 1 LONG for each choker	SEND BACK THAT NUMBER OF CHOKERS
3 SHORT — pause — 1 SHORT	SEND OUT STRAWLINE ON HAULBACK
3 SHORT — pause — 1 SHORT — pause — 1 SHORT for each extension	SEND STRAWLINE EXTENSIONS (NOT COILS) ON HOOK
1 LONG — pause — 2 SHORT — pause — 2 SHORT	SEND PREARRANGED MISCELLANEOUS RIGGING TO BACK-END ON HOOK (E.G. STRAWLINE COILS)

Table 26-6: Requirements for radio controlled carriages

- These carriages are fitted with and controlled by an onboard computerized radio control system. This radio system is operated independently through a transmitter separated from that of the yarder — The yarding and carriage frequencies must be separate, registered and coordinated through the WCB co-ordination system to ensure that one does not interfere with the other or with another

— An audible signal must be sounded at the carriage and not at the yarder. This signal must have a tone different from that of the yarder signal. — Standard skyline signals will apply at the yarder	
a) Audible radio signals for hydraulic accumulator or motor driven slack pulling and dropline carriages with or without skyline lock	
2 SHORT	LOCK SKYLINE CLAMP
5 SHORT	SLACK THE DROPLINE
1 SHORT	STOP PULLING SLACK
5 SHORT, etc.	PULL SLACK AGAIN
2 SHORT — pause — 1 LONG	UNLOCK SKYLINE CLAMP
If fitted with engine controls	
1 SHORT — pause — 1 LONG	STOP ENGINE
1 LONG — pause — 1 SHORT	START ENGINE
Carriages with variable dropline speeds must have a special signal for the speed changes. These signals must be different from standard yarding signals.	
b) Audible radio signals for radio-controlled motorized self-contained yarding carriages with or without skyline locks	
2 SHORT	LOCK SKYLINE CLAMP
5 SHORT	SLACK THE DROPLINE
1 SHORT	STOP THE DROPLINE
3 SHORT	PICK UP THE DROPLINE
2 SHORT — pause — 1 LONG	UNLOCK SKYLINE CLAMP
If fitted with engine controls	
1 SHORT — pause — 1 LONG	STOP ENGINE
1 LONG — pause — 1 SHORT	START ENGINE
Carriages with variable dropline speeds must have a special signal for the speed changes. These signals must be different from standard yarding signals.	

Table 26-7: Hand signals
A Cable logging

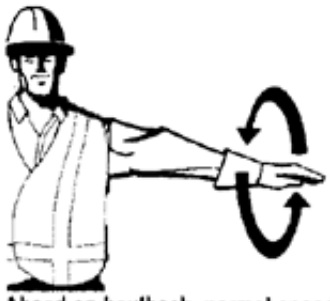
Mainline ahead, normal.
Raise one arm.

Mainline ahead, fast. One arm raised, hand 'fluttering'.

Mainline ahead, slow.
Both arms raised.

Stop any moving line and hold.

Slack the mainline, easy. Both hands extended at sides, hands fluttering.

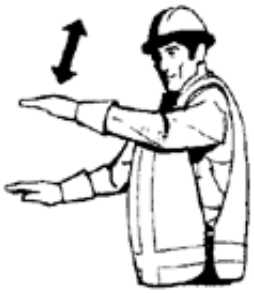


Ahead on haulback, normal speed. One arm extended, rotating.

Haulback ahead, slow. Both arms extended, rotating.

Slack the haulback. Hands in front of body using chopping motion.

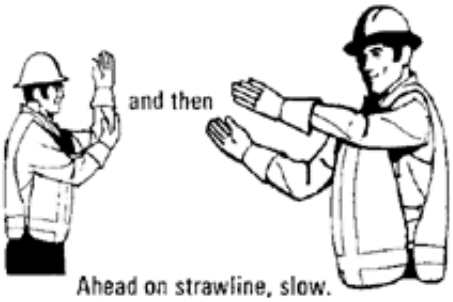
Tightline. Hands overhead, fingertips touching.



Slack the strawline. Pat back of hand with other hand.

Hold dog drum or lock brake lever. Clasp one hand with the other.

Ahead on strawline. Touch hand to bent elbow.



Ahead on strawline, slow.

Slack mainline all off. Arm extended at side, flipping wrist.

Table 26-7: Hand signals (Continued)
A Cable logging (Continued)

LOWER SKYLINE/GUYLINE
Pat top of head as applicable

SLACK THE DROPLINE
Cross arms in front and away from body flipping wrists

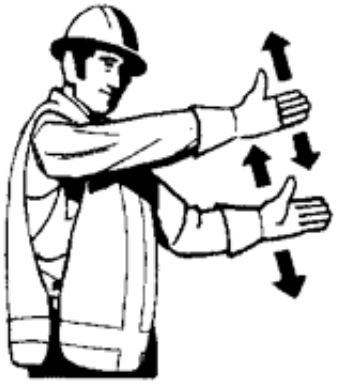
AHEAD ON THE DROPLINE
Cross arms in front

RAISE SKYLINE/GUYLINE
Move hand up from top of head several times

Table 26-7: Hand signals (Continued)
B Skidding

To back up the tractor -- rotate the hand.

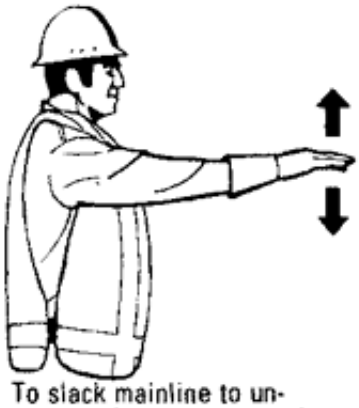
When hooker wants tractor to back in, slap butt.
If tractor is to head in, put fingers on top of the head.



Tractor hooker's signal to tractor driver as to where chokers are to be dropped. Hooker faces in direction tractor is to stop and stands where chokers are to be dropped. Indicates what is to be done by swinging both hands in front, hands open with thumbs up.

To use upper winch, pat back of wrist with palm of other hand. Follow by standard signals.

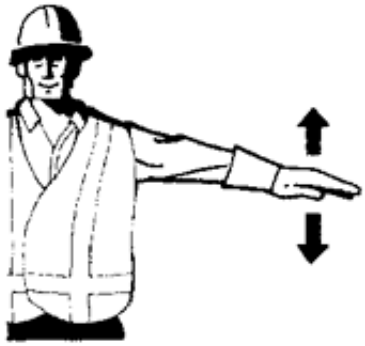
Ahead on mainline.



To slack mainline to unhook choker – wave hand extended, palm down.

Stop any moving line and hold.

To stop tractor – hold one hand out with palm down.



Go ahead on tractor.

Table 26-8: Voice commands for grapple yarders

Item	To instruct operator to:	Signaller says:
1	Grapple log and go ahead	CLOSE AND GO
2	Close grapple but not go ahead	CLOSE
3	Stop rigging	STOP
4	Open grapple	OPEN
5	Move empty grapple ahead	AHEAD
6	Move empty grapple back	BACK

8	Slack mainline	MAINLINE
9	Slack haulback	HAULBACK
10	Lower grapple	DOWN
11	Slack strawline	SLACK STRAWLINE
12	Swing to operator's left	SWING LEFT
13	Swing to operator's right	SWING RIGHT
14	Hold haulback and go ahead on mainline	TIGHTLINE

[Enacted by B.C. Reg. 20/2008, effective May 1, 2008.]

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Part 27 Wood Products Manufacturing

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27.1 Application

This Part applies to workplaces that process logs or other wood into lumber, shakes, shingles, chips, plywood, particleboard or other wood products.

Note: See Part 12 (Tools, Machinery and Equipment) for requirements for woodworking equipment.

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27.2 Protection from flying debris

Equipment used to manufacture wood products must be designed or fitted with effective guarding or screening to protect workers from flying chips, debris, or hazards in the event of the failure of equipment components.

27.3 Kickback and kickout protection

(1) Edgers and other wood processing equipment which expose workers to the danger of material being thrown back by the saws must be fitted with effective kickback fingers, and if the danger remains when the kickback fingers are raised, a substantial barrier must be provided to protect workers.

(2) A worker must not be in front of raised kickback fingers while the saw is in motion.

(3) A worker must not be allowed at the outfeed end of an edger or other similar wood processing equipment where a kickout hazard exists, and inadvertent entry into such a danger area must be prevented.

(4) Edgers equipped with automatically activated kickback fingers must have interlocks to prevent forward motion of the feed rolls while the kickback fingers are in a raised position.

27.4 Pressure rolls

(1) Edger pressure rolls must

(a) have a solid continuous rim surface, and

(b) be kept in contact with the material being cut.

(2) Only one piece of material at a time may be fed into any single set of pressure rolls for an edger, surfacer, or planer.

(3) A multiple feed edger must have separate pressure rolls for each feed.

27.5 Crossing green chains and decks

(1) A worker who is required to cross a green chain or transfer deck must

(a) be instructed in the hazards and proper procedures to follow,

(b) ensure the transfer deck is stopped before crossing, and is restarted only after the crossing is completed,

(c) cross only on fully decked locations where no hazard of falling exists and where safe means of access and egress have been provided, and

(d) cross only in a space clear of material.

(2) If a worker is required to access a transfer deck in order to control the flow of material as part of normal production work, the employer must ensure that

(a) safe work procedures are established and, where practicable, posted adjacent to the machinery,

(b) the worker is instructed in and follows the safe work procedures,

(c) the transfer deck is stopped before access,

(d) the worker accesses only fully decked areas, where there is no hazard of falling and where safe access and egress has been provided, and

(e) the stop control devices cannot be overridden by another control device, or by another worker.

27.6 Lumber package rollcase access

If a worker must access a lumber package rollcase for normal production work,

(a) the rollcase must be stopped, and

(b) the equipment and machinery must have effective safeguards to prevent injury to workers due to movement of material.

Note: Safeguards include interlock barrier guards, pressure sensing mats, jog controls, mechanical stops

or other similar devices under the exclusive and immediate control of the worker.

27.7 Mechanical handlers

A mechanical handler must be effectively safeguarded to prevent contact by workers.

27.8 Veneer clippers

A veneer clipper must be guarded to prevent a worker's hands or fingers being placed under the knife.

27.9 Kilns

(1) A dry kiln must have effective safety devices to prevent a door or carrier from falling.

(2) If a worker may be entrapped in a dry kiln, there must be an effective means of emergency escape, clearly identifiable by anyone inside the kiln.

27.10 Personnel hoists

A personnel hoist for a hot press, a pulp and paper dryer or a similar machine must

(a) have effective means to prevent the platform from falling if the power or equipment fails,

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

(c) have critical components regularly inspected by a qualified person,

(d) have the rated load clearly marked on the hoist platform,

(e) have a log of inspections, maintenance and repairs meeting the requirements of Part 4 (General Conditions), and

(f) be fitted with guardrails and toeboards meeting the requirements of Part 4.

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

* See also section 4.3 of the OHS Regulation.

27.11 Hidden hazards

Where dangers, and dangerous equipment such as a jump saw, or automated equipment operated by photocells or proximity switches, are not readily visible to workers, the dangers must be made conspicuous by signs, placards or other effective means.

27.12 Communication

An effective means of communication must be provided and safe work procedures must be established to

ensure the safety of workers when 2 or more workers are required to work as a team.

27.13 Water operations

Water operations must meet the requirements for such operations in Part 26 (Forestry Operations and Similar Activities.

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27.14 Unattended machinery

An unattended saw and other woodworking machinery must not be left running if a worker could be endangered.

27.15 Sharpening saws and knives

Equipment used for grinding saws and knives must have an effective local exhaust ventilation system or other effective means of dust and mist control.

27.16 Babbitt melting

(1) Babbitt melting must be done at a controlled temperature.

(2) Exhaust hoods must be provided for melting and pouring operations or an equally effective air contaminant control method must be used.

(3) A babbitt pot must be covered.

(4) If practicable, a lead-free babbitt must be used.

27.17 Sharp-edged tools

The cutting edges of saws, knives, cutting heads, and other sharp-edged devices, must be

(a) guarded to prevent worker contact, when stored in operating areas, and

(b) handled and transported in a manner which will not endanger workers.

27.18 Circular saw guarding

(1) If the main axis of [illegible]

blade, the portions of the blade outside the cutting area must be fully guarded.

(2) Guards must be arranged to allow cutting with a minimum amount of exposed blade.

27.19 Band saw guarding

(1) A band saw and its band wheels must be enclosed or otherwise effectively guarded except in the cutting area to prevent worker contact and to restrain the saw blade in the event of blade failure.

(2) If metal enclosures are used with shake band saw wheels, the top door panel must be fitted with an inside wooden liner.

(3) For a hand-fed shake band saw, the distance between the top of the table rollers and the top guide must not exceed 36 cm (14 in).

27.20 Slasher and trim saws

(1) Barriers to protect workers from ejected material must be installed in front of and behind all multiple slashers and multiple trim saws.

(2) If a worker may be caught or pulled into a saw or other danger area by a lug chain or similar transfer system, an emergency stopping device must be fitted on the conveyance to automatically stop the transfer system before the worker is pulled into the danger area.

27.21 Circular cutoff saws

A circular cutoff saw must be fully enclosed, guarded, or located to prevent inadvertent contact with the running saw when it is in the retracted position.

27.22 Splitters

(1) If a worker may be exposed to kickback from a circular saw with rip-type teeth, the saw must be fitted with an effective splitter.

(2) Subsection (1) does not apply to an edger or circular resaw which is equipped with anti-kickback fingers.

27.23 Chop, trim and swing cutoff saws

(1) Each swing cutoff saw must have

(a) a device to automatically return the saw to the back of the table,

(b) a limit chain, or similar device to prevent the saw from swinging beyond the front of the table and past a position where the gullets of the lowest teeth rise above the top of the table, and

(c) a latch or similar device to prevent saw rebound.

(2) A swing cutoff saw must not be positioned so that any part of the saw at rest is in line with

the saw.

(3) Each chop, trim and swing cutoff saw must

(a) be effectively guarded,

(b) be guarded by location, or

(c) have other effective means that prevent the operator's hands being placed in the cutting area when the saw is activated.

27.24 Circular saw guides

(1) Circular head saws and scragg saws must be equipped with safety guides.

(2) If a top saw is only used occasionally, such as to cut flares off oversized logs, the requirements of subsection (1) do not apply.

(3) Guides that must be adjusted while the saw is in motion must have the adjustment controls located away from the danger area.

27.25 Cutoff saw interlocks

If a powered conveyor feeds material at right angles to the blade of a circular cutoff saw, the system must have interlock control devices to prevent side loading of the saw.

27.26 Saw operator location

Log and block cutoff saw operators must be positioned so that no part of the operator's body is in line with the saw unless adequate barriers have been installed.

27.27 Saw speeds

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

* See section 4.3 of the OHS Regulation.

27.28 Saw maintenance

(1) A saw must be inspected frequently and maintained in a safe condition.

(2) A dull, badly set, improperly filed or tensioned saw, or an inserted tooth saw with poorly fitting shanks or worn bits, must be removed from service.

(3) A saw must be inspected for cracks and other defects each time the saw is sharpened, and a cracked saw must be removed from service until repaired by a qualified person.

(4) A saw or saw collar damaged by excessive heat or undue stress must be removed from service until

27.29 Cracks in circular saws

(1) A circular saw with a crack of any size adjacent to the collar line, or with a crack elsewhere which exceeds the limit specified in Table 27-1, must be removed from service until the crack is repaired and the saw retensioned by a qualified person.

(2) A circular saw with a crack near the periphery which does not exceed the limit specified in Table 27-1 must be removed from service until the crack is repaired or the lengthening of the crack has been arrested by slotting, centre punching, drilling or other effective means, and the saw is retensioned as necessary, by a qualified person.

Table 27-1 Circular saw crack limits

Saw diameter		**Maximum length of crack**	
Millimetres	Inches	Millimetres	Inches
up to 300	up to 12	13	1/2
300 to 610	12 to 24	25	1
610 to 915	24 to 36	38	1 1/2
915 to 1220	36 to 48	50	2
1220 to 1525	48 to 60	64	2 1/2
over 1525	over 60	76	3

27.30 Cracks in band saws

(1) A band saw, other than a shake band saw, with a crack exceeding the limit specified in Table 27-2 must be removed from service until the crack is repaired and the saw retensioned by a qualified person.

(2) A band saw, other than a shake band saw, with a crack not exceeding the limit specified in Table 27-2 must be removed from service until the crack is repaired or the lengthening of the crack has been arrested by centre punching or other effective means, and the saw retensioned as necessary, by a qualified person.

(3) A shake band saw with a crack must not be used.

Table 27-2 Band saw crack limits

Band saw width		**Maximum length of crack**	
Millimetres	Inches	Millimetres	Inches
up to 125	up to 5	1/10 of saw width	1/10 of saw width
125 to 300	5 to 12	13	1/2
over 300	over 12	19	3/4

27.31 Band saw wheel wear limits

(1) Unless otherwise specified by the manufacturer or a professional engineer, the minimum rim thickness of a cast steel band saw wheel measured 25 mm (1 in) inboard from the rim edge must be

(a) 14 mm (9/16 in) for wheels up to and including 1.8 m (6 ft) diameter,

(b) 16 mm (5/8 in) for wheels over 1.8 m (6 ft) up to and including 2.75 m (9 ft) diameter, and

(c) 17.5 mm (11/16 in) for wheels over 2.75 m (9 ft) diameter.

(2) A band saw wheel over 1.2 m (48 in) diameter must be nondestructively tested for cracks by a qualified person at least once a year.

(3) A cracked wheel or a wheel which has been exposed to excessive heat must be removed from service until the wheel manufacturer, or a professional engineer, has certified it as safe for continued use.

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27.32 Log-haul walkways

Unless clearly impracticable, every log-haul must have at least one walkway

(a) fitted with cleats and handrails, and

(b) of sufficient width to enable workers to stand clear of logs in the log haul.

27.33 Log hauling equipment

(1) The employer must ensure that, when log hauling and similar hoisting equipment is being used, workers are positioned so that they will not be endangered by logs as a result of power or equipment failure, or other similar cause during lifting and lowering operations.

(2) Log hauling and similar hoisting equipment must be equipped with

(a) devices which prevent logs from running back in the event of power failure, and

(b) an emergency stop control by which the operator can stop the equipment.

(3) The emergency stop control must not be capable of being overridden.

27.34 Rolling logs

Provisions must be made to protect workers from rolling logs.

27.35 Barker feed restraints

Logs must be restrained against dangerous movement at the infeed and outfeed sections of a mechanical ring barker.

27.36 Bundle breaking

When wires, strapping, or bundling cables are removed from bundled logs in booming grounds, millyards or dryland sorting areas, the following requirements must be met:

(a) specific written safe work procedures must be developed and followed by all workers involved in the operation;

(b) the load must be restrained to prevent logs or log chunks from rolling off the bundle, or otherwise endangering the workers;

(c) workers must not be allowed beneath a suspended load or equipment.

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27.37 Buffer stops

Substantial stops, preferably with spring, pneumatic, or hydraulic buffers, must be installed at each end of the carriage travel area.

27.38 Locking control levers

The employer must ensure that means are provided and used to eliminate inadvertent operation of the headrig log-turning and carriage-feed controls.

27.39 Carriage track barriers

(1) If a headrig sawyer may be exposed to the hazard of logs, sawn material, or chunks entering the booth or operator's area, the sawyer must be protected by

(a) a substantial barrier between the sawyer and carriage track, extending from the floor of the booth to 60 cm (2 ft) above the rollcase, and

(b) a substantial barrier at the log loading area.

(2) Where necessary to deflect sawn material away from the sawyer, a substantial barrier must be installed between the sawyer booth and the saw.

27.40 Preventing contact

Headrigs must have safety devices which prevent carriage equipment or dogs from contacting the saw or slabber head.

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27.41 Hog and chipper chutes

(1) Hog and chipper feed chutes must be equipped with baffles or other effective means to prevent material from being thrown from the equipment.

(2) A worker feeding or clearing a hog or chipper must be restrained by a safety belt and lanyard, unless otherwise protected from falling into the conveyor or machine.

27.42 Hogs, chippers and cutting heads

(1) Until the rotor has stopped turning, no attempt must be made to remove a guard, hood, shroud or inspection plate from a hog, chipper, or cutter head.

(2) A makeshift device that may cause injury to a worker must not be used to brake or slow down a rotor or cutter head.

(3) A mill chipper with a shroud, hood or inspection plate that can be removed before the rotor has stopped must have an effective brake.

(4) Subsection (3) does not apply to a whole log chipper.

(5) A hog or chipper must have a means of determining if rotating parts are in motion or have stopped.

(6) A production planer installed after January 1, 1999 must be equipped with brakes on the heads, and all production planers must have brakes on the heads by January 1, 2000.

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27.43 Height of chip and sawdust piles

(1) The height of any excavated or unstable face of a chip, hog fuel or sawdust pile must not exceed the safe reach of the mobile equipment being used to handle the material.

(2) Workers unprotected by equipment or barriers must not enter a hazardous area near the face of a chip, hog fuel or sawdust pile.

27.44 Wood products storage

(1) A pile of lumber, veneer, plywood or similar wood product must be erected plumb and level, and be maintained in a stable condition.

(2) Spacing blocks which permit stable piling and unobstructed access for the forks of lift trucks must be placed beneath each pile and between loads.

(3) Veneer loads must be supported by at least 3 spacing blocks of sufficient size to permit stable piling and unobstructed access for the forks of lift trucks, and individual load height must not exceed 1 m (3.3 ft).

(4) Loads of lumber built up for storage or transportation must be stabilized

(a) using stripping material which, where feasible, does not protrude beyond the side of the load or package, or

(b) by other effective means.

(5) If wood products are piled on a foundation that is firm and level

(a) loads of lumber may be piled up to approximately 4.5 m (15 ft) high,

(b) unitized loads of lumber or loads of lumber 15 cm (6 in) or more in width may be piled up to approximately 6 m (20 ft) high, except for the outer pile which must not exceed 4.5 m (15 ft),

(c) if 3 or more loads of any size lumber are cross-tied at each successive level, the loads may be piled up to approximately 11 m (35 ft) high,

(d) veneer piled in the vicinity of passageways or work areas must be adequately supported to prevent falling,

(e) veneer storage piles must not exceed 4.5 m (15 ft) high, and

(f) loads of plywood and similar wood products may be piled up to approximately 6 m (20 ft) high except for the outer stack which must not exceed 4.5 m (15 ft).

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Shake and Shingle Mills

27.45 Shake splitters and cubers

Foot pedal controls on shake splitters and cubers must be fitted with effective guards to prevent inadvertent operation of the equipment.

27.46 Block size and pile height

(1) Blocks must be securely piled not more than one tier high when on the sawyer's table, and no higher than 1.8 m (6 ft) elsewhere.

(2) Blocks must be of a size that does not interfere with the safe loading of the carriage jaws.

27.47 Shingle saws

A shingle machine with a circular head saw must have a sawtooth guard which

(a) projects at least 38 mm (1 1/2 in) beyond the exposed cutting edge of the headsaw,

(b) will prevent the headsaw leaving the arbor should the securing nut fail, and

(c) is located and maintained not more than 13 mm (1/2 in) from the side of the saw.

27.48 Shake resaw arm guards

A hand-fed shake resaw must have a substantial arm guard on the working side of the blade to prevent the operator from contacting the blade.

27.49 Clipper saw guards

(1) Except for the portion that is exposed to trim shingles, a clipper saw must be effectively guarded by a substantial metal guard of at least 16 mm (5/8 in) diameter round stock, or a flat bar of equivalent strength, installed not more than 100 mm (4 in) above the saw and not more than 13 mm (1/2 in) from the plane of the saw.

(2) Clipper saw boards must have substantial finger guards, not less than 130 mm (5 in) long and 32 mm (1 1/4 in) deep, designed and adjusted to prevent the operator's fingers from contacting any exposed saw teeth below the clipper board.

27.50 Clipper saw brakes

(1) An independently motor driven clipper saw must be equipped with an effective braking device, automatically activated when the motor power ceases, and which is capable of bringing the saw to a stop in not more than 20 seconds.

(2) Braking devices must be of a design acceptable to the Board.

27.51 Treadle controls

(1) A shingle machine jaw treadle must be arranged so that the operator must activate the clutch control to start the machine after the treadle is released, and the use of devices to permit the machine to automatically start when the jaw treadle is released is prohibited.

(2) Shingle machine jaw treadles must be constructed of, or covered with, non-skid material.

27.52 Set works and reciprocating parts

(1) Ratchet levers on the set works of a shingle cutting machine must be guarded.

(2) Reciprocating parts of shingle machine carriage drives must be guarded to prevent contact by workers.

27.53 Carriage speed

Conventional shingle machine carriage speed must not exceed 34 strokes per minute.

Note: A conventional shingle machine is a manually operated machine with a circular head saw and carriage and a circular jointer (clipper) saw, for block sizes 40 cm (16 in) and over.

27.54 Saw diameter

The head saw of a conventional shingle machine must have a minimum diameter of 1 m (39 in).

27.55 Unattended machines

The employer must ensure that a worker does not leave a shingle machine or clipper saw unattended if the saw is in motion.

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Part 28 Agriculture

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28.1 Definitions

28.1 In this Part:

"agricultural operations" include the production activities related to

(a) apiculture,

(b) berry farming,

(c) Christmas tree culture,

(d) composting,

(e) dairy farming,

(f) egg farming,

(g) forest seedling and seed production,

(h) grain and oilseed production,

(i) greenhouse operations,

(j) herb production,

(k) horticulture, including floriculture, tree nurseries and ornamental nurseries,

(l) insects raised for biological pest control,

(m) orchards,

(n) poultry farming,

(o) a riding academy, or the boarding or breeding of horses,

(p) seed production,

(q) sod or turf production,

(r) vegetable farming,

(s) wool, hide, feather or fur production, and

(t) the raising of crops or animals for human or animal consumption,

but do not include

(u) the production of agricultural byproducts or of manufactured derivatives from agricultural raw material,

(v) the breeding or raising of pets other than horses, or

(w) aquaculture;

"agricultural tractor" means a vehicle, with more than 20 engine horsepower, running on wheels, designed to furnish the power to pull, carry, propel or drive an implement that is designed or used for agriculture, but does not include a self-propelled implement;

"farm land" means land used for agricultural operations;

"low-profile tractor" means an agricultural tractor with the following characteristics:

(a) the front wheel spacing is equal to the rear wheel spacing, as measured from the centre line of each right wheel to the centre line of the corresponding left wheel;

(b) the clearance from the bottom of the tractor chassis to the ground does not exceed 46 cm (18 in);

(c) the highest point of the hood does not exceed 1.5 m (60 in);

(d) the tractor is designed so that the operator straddles the transmission when seated;

"orchard ladder" means a self-supporting portable ladder of the tripod type, wide at the bottom and tapering towards the top, non-adjustable in length, and consisting of side rails, flat steps and a hinged, single leg back section.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.2 Application

This Part applies to agricultural operations on farm land.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

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Division 1 - General Conditions

28.3 Cold storage rooms

Cold storage rooms must have at least one door that can, at all times, be opened from inside the room.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.4 Bridges and culverts

(1) Bridges and culverts under roadways within the agricultural workplace must be

(a) designed, constructed and maintained so as to safely support the heaviest load expected to be imposed on them, and

(b) of sufficient width to permit equipment and machinery to cross safely.

(2) A bridge within the agricultural workplace must also be provided with bullrails not less than 25 cm (10 in) in height.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.5 Barriers for manure pits

(1) Where manure or other material is loaded into pits by self-propelled equipment, the employer must install barriers sufficient to prevent the equipment from falling or inadvertently entering the pit.

(2) If the use of barriers required by subsection (1) is not practicable, the employer must adopt procedures that provide equivalent protection for workers.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.6 Instruction of seasonal, temporary and other workers

When workers, including seasonal and temporary workers, start employment, the employer and the employer's supervisor must ensure that they are instructed about the safe performance of their duties.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.7 Animal handling

(1) An employer must ensure that workers have a safe means of escape from any enclosure occupied by animals that are potentially dangerous to workers.

(2) If a worker is required to handle animals, the employer must ensure that the worker is effectively instructed and trained and is competent to perform the assigned work.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.8 Indoor air quality exception

Sections 4.70 to 4.80 (Indoor air quality) do not apply to a private residence.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.9 Control of environmental tobacco smoke exception

Sections 4.81 to 4.83 (Environmental tobacco smoke) do not apply in a private residence, except when a worker, other than the occupant of the residence, is working in the residence.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.10 Drinking water

(1) An employer must ensure that an adequate supply of potable drinking water is available to workers during the workday.

(2) Water in irrigation ditches or other similar sources is not potable drinking water for the purposes of subsection (1).

(3) If drinking water is provided in portable dispensers, the dispensers must be

(a) equipped with a tap,

(b) capable of being covered, and

(c) maintained in a sanitary condition.

(4) Workers must be informed of any water supplies that are unsafe to drink.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

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28.11 Personal hygiene

(2) If work processes involving substances such as lead, mercury, asbestos, silica or pesticides are high hazard, the employer must ensure that workers are provided with adequate and appropriate shower and change facilities.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.12 Biohazards exception

Repealed. [B.C. Reg. 199/2014, effective February 25, 2015.]

28.13 Anhydrous ammonia

(1) Sections 6.116 to 6.132 (Toxic process gases) do not apply to anhydrous ammonia fertilization systems.

(2) If anhydrous ammonia is stored or used for the purpose of fertilization, the employer must ensure that

(a) the equipment containing anhydrous ammonia is inspected before each use, to prevent accidental leakage or spillage,

(b) the hose end-valves are in the closed position when the equipment is not operating, and

(c) the relief and vapour valves are positioned so that any discharge is directed upwards and away from the worker's operating position.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.14 Ventilation of buildings near manure tanks

(1) A worker must not enter or remain in a building or structure adjoining a liquid manure tank while the manure is being agitated.

(2) Following agitation of the manure, any adjoining building or structure must be thoroughly ventilated before a worker is permitted to re-enter it.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

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28.15 Horseback riding exception

Section 8.23 (non-slip footwear) does not apply to a work activity involving horseback riding.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

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28.16 Warning signs for power take-off devices

At conspicuous locations near rotating shafts driven by power take-off devices, warning signs must be located specifying that shields must be kept in place.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.17 Signs and procedures for equipment guarding

If the removal of a guard or access door would expose a worker to a component that continues to rotate after the power to the component has been disengaged,

(a) the employer must apply a sign to the guard or access door warning of the danger, and

(b) the guard must not be removed or access door opened until enough time has elapsed to bring all components to a complete stop.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.18 Hay balers

A worker using a hay baler must not attempt to clear hay from the collection area unless the engine is stopped and cannot be inadvertently started.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.19 Round balers

A worker must keep clear of the discharge area of a round baler and the area under the hatch unless the hatch is blocked open.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.20 Post-hole diggers

A post-hole digger must have

(b) shear bolts as specified by the manufacturer, and

(c) a hold-to-run control when operated as a hand-held unit.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.21 Post drivers

A worker operating a post driver must

(a) lower the hammer and stop the engine when adjustment or maintenance is required,

(b) if necessary for safety, steady the post with a steady fork or guide, and

(c) lower or block the hammer when the machine is not in use.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.22 Chain saws exception

Section 12.72 does not apply to a chain saw used in agricultural operations on farm land, if the chain saw was purchased for first use before December 31, 1993.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.23 Hand winch for auger conveyors

A hand winch for raising an auger conveyor must

(a) have a control that will hold the auger at any angle, and

(b) respond only when the handle is turned.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.24 Alternative means of evaluation for automotive lifts and vehicle supports

(1) Despite section 12.76, if written instructions are not available from the manufacturer or a professional engineer, the instructions may be provided instead by any other person qualified to develop them.

(2) Despite sections 4.8 and 12.79, if a modification is made to a device listed in section 12.79(1) or if the manufacturer's rated capacity is not known, the rated capacity may be determined by a person qualified to do so.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.25 Orchard ladders exception

Sections 13.2(1) and 13.5(a), (b) and (c) do not apply to orchard ladders.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 422/2004, effective January 1, 2005.]

28.26 Orchard ladders design

An orchard ladder must

(a) meet the construction requirements of *CSA Standard CAN3-Z11-M81, Portable Ladders*, except that the spreader requirement does not apply to orchard ladders,

(b) have a rail spread that increases at least an average of 6 cm (2.5 in) for each 30 cm (12 in) of ladder length, and

(c) when necessary for safety, have the feet of the ladder equipped with steel points or other non-slipping bases designed for the ground on which the ladder will be used.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.27 Orchard ladders instructions and use

(1) An employer must ensure that

(a) the ladder used is appropriate for the task, and

(b) a worker using an orchard ladder is instructed in its proper use.

(2) Repealed. [B.C. Reg. 422/2004, effective January 1, 2005.]

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.28 Previously installed fixed ladders exception

Despite section 13.2(1)(a), a fixed ladder existing on or before January 1, 2006, and not conforming to the current or an earlier edition of *ANSI Standard A14.3-1992, Safety Requirements for Fixed Ladders*, may remain in use subject to any modifications considered necessary by the Board.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 422/2004, effective January 1, 2005.]

28.29 Small cranes and hoists exception

(1) Sections 14.2 to 14.33 and 14.44 do not apply to a job built crane or hoist for use on site with a rated capacity of less than 1 tonne (2 200 lbs) if

(a) the device is built or otherwise assembled by a person qualified to do the work,

(b) the rated capacity of the device, including support structures, is determined by a person qualified to

(c) the rated capacity is marked on the device and is not exceeded,

(d) the device is not used to support a worker,

(e) the device is operated so that a worker is not under the load,

(f) the device is inspected and maintained at a frequency and to the extent required to ensure that every component is capable of carrying out its original design function with an adequate margin of safety,

(g) inspection and maintenance records are maintained for the device consistent with Part 4 (General Conditions), and

(h) any modifications to the device are made by a person qualified to do the work.

(2) Despite subsection (1), the Board may require compliance with sections 14.2 to 14.33 and 14.44 if the design of the equipment or the circumstances of use indicate the need.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.30 Altered application dates for cranes and hoists

(1) The certification of drop stops required under section 14.19(2) must be completed by January 1, 2006.

(2) Section 14.54 applies to a bridge, overhead or gantry crane, if installed after January 1, 2006, or to a crane or its runway if it is modified after that date.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.31 Alternative requirements for rigging identification

The requirements for identification of various rigging components in sections 15.5, 15.24(3), 15.42, 15.46, 15.52, 15.55 and 15.59 may also be met if the employer is able to determine the information required for a particular device by any means of identification specific to it.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.32 Evaluation of a rigging device

The requirements of sections 15.6(2), 15.27, 15.28(1), 15.32 and 15.36 for the competency of a person evaluating a device may be met by a person who is qualified to conduct the evaluation.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.33 Older mobile equipment exception

The requirements for emission controls, supplementary steering, safe starting and load ratings of sections 5.75, 16.14, 16.16 and 16.20 apply, in agricultural operations on farm land, only to equipment purchased for first use after January 1, 2006.

28.34 Means of escape exception

(1) Mobile equipment that does not require window guarding as specified by section 16.21 is exempt from section 16.17(1) for an alternate means of escape.

(2) Equipment with a single cab entrance door, that is exempt under subsection (1), must have an opening window or alternate means of escape on a surface other than the door side, satisfying the requirements of the *Society of Automotive Engineers (SAE) Standard J185, June 1988, Recommended Practice for Access Systems for Off-road Machines*.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.35 Alternative evaluation of an attachment

Despite section 16.19, a bucket, fork, boom, hoist or other load handling equipment may be installed on mobile equipment if authorized by a person qualified to evaluate the safety of the installation.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.36 Alternative for design of riding station

The design of safe facilities specified under section 16.31(2)(b) also may be done by a person qualified to design the facilities.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.37 Safety device on older trucks exception

Section 16.37(4) (requirements for a mechanical device capable of supporting an empty dump box in the raised position) applies only to dump trucks with a chassis manufactured after January 1, 2006.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.38 Protective structures exception for mobile equipment

(1) Other than for agricultural tractors, section 16.21(1) and (2) applies only to new equipment purchased for first use after January 1, 2006.

(2) Despite subsection (1), the Board may require a protective structure to be installed on any mobile equipment if the design of the equipment or the circumstances of use indicate the need.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.39 ROPS on older equipment exception

Other than for agricultural tractors, the requirements of section 16.22(1) for rollover protective structures (ROPS) apply only to new equipment purchased for first use after January 1, 2006.

28.40 Protective structures exception for agricultural tractors

Section 16.21(1) and (2) does not apply to an agricultural tractor manufactured on or before January 1, 1985.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.41 Rollover protective structures for agricultural tractors

(1) In this section:

"risk assessment" means an assessment of the risk that an agricultural tractor will roll over while it is being operated, based on the relevant circumstances of the proposed operation including the following:

(a) the stability of the agricultural tractor, taking into account such factors as the configuration of the agricultural tractor and any attachments mounted on or pulled by the agricultural tractor during operation;

(b) the ground conditions where the agricultural tractor will be operated, including the presence of ditches, drop-offs and ground irregularities such as holes, soft spots or mounds;

(c) the grades on which the agricultural tractor will be operated;

(d) the nature of the activities to be performed with the agricultural tractor;

(e) the applicable safe work procedures established by the employer;

(f) the training and experience of the operator;

(g) the presence or absence of direct supervision of the operator by a qualified person;

"ROPS" means a rollover protective structure that meets the requirements of sections 16.23, 16.24, 16.25 and 16.26.

(2) Section 16.22 does not apply to an agricultural tractor if it is being driven or used as part of agricultural operations on farm land.

(3) Subject to subsection (4), a worker must not drive or use an agricultural tractor as part of agricultural operations on farm land unless the agricultural tractor has a ROPS.

(4) A worker may drive or use an agricultural tractor without a ROPS as part of agricultural operations on farm land if a qualified person has carried out a risk assessment and has determined that, in the circumstances, the agricultural tractor can be operated safely and with a low risk of a rollover, and any of the following apply:

(a) the agricultural tractor was manufactured on or before January 1, 1985;

(b) the agricultural tractor

(i) is a low profile tractor that is used in agricultural operations on farm land in places that have low overhead clearance, such as orchards, hop yards, farm buildings or greenhouses, where overhead

(ii) is being driven or used as part of those agricultural operations;

(c) the agricultural tractor is fitted with implements that are incompatible with a ROPS.

(5) The employer must permanently affix, on an agricultural tractor without a ROPS that is driven or used as part of agricultural operations on farm land, a notice that is legible and visible to a person in the operator's position, stating that the agricultural tractor

(a) does not have a rollover protective structure, and

(b) may be driven and used only in areas and for activities authorized by the employer.

[Enacted by B.C. Reg. 188/2011, effective February 1, 2012.]

28.42 Use of seat belts on agricultural tractors

Despite section 16.33(2), a seat belt must be used at all times when operating an agricultural tractor equipped with a rollover protective structure.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.43 General requirements for mobile elevating work platforms

A mobile elevating work platform used in an orchard must

(a) have a platform equipped with a non-skid surface,

(b) be provided with a drive system that ensures there will be no unintended movement of the unit, and

(c) not be operated on sloping ground unless

(i) specific instructions from the manufacturer for the operation are followed, and

(ii) the unit is equipped with a braking system capable of restraining the machine under any condition of use, or the unit is equipped with wheels that will not turn unless driven.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.44 Mobile elevating work platform design standards

(1) Except as provided by subsection (2), a mobile elevating work platform used in an orchard must meet the requirements of section 13.2(1).

(2) A mobile elevating work platform may be used in an orchard if it has

(a) a platform equipped with

(i) a gate that does not swing outward and that can be securely fastened in the closed position to minimize the risk of accidental opening,

890 N (200 lbs) applied in any direction at any point on the top rail, and

(iii) a toe rail, on the sides not serviced by a gate, which is approximately 8 cm (3 in) in height with a maximum clearance between the floor and the bottom edge of the toe rail of 5 cm (2 in), and

(b) for equipment manufactured after December 31, 1993, a maximum platform height of 3.6 m (12 ft).

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 422/2004, effective January 1, 2005.]

28.45 Identification on mobile elevating work platforms

A mobile elevating work platform used in orchards, if manufactured after December 31, 1993, must have the following information permanently and conspicuously marked on it:

(a) certification to confirm the standard met by the device;

(b) the make, model, serial number and manufacturer's name;

(c) the rated platform workload;

(d) the maximum platform height and travel height;

(e) the maximum slope on which the device may be operated when the platform is elevated.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.46 Fall protection exception

Section 13.33(1) and Part 11 (Fall Protection) do not apply to a worker using a mobile elevating work platform in an orchard if the platform height is 3.6 m (12 ft) or less.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 422/2004, effective January 1, 2005.]

28.47 Annual inspection and certification exception

For the purposes of application of section 13.12, 13.23(1)(b) and 13.23(5) a person may make the inspection and determination of safety for continued use of a mobile elevating work platform used in orchards if the person is qualified to do so, and the work platform has a maximum operational height of 3.6 m (12 ft).

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 422/2004, effective January 1, 2005.]

28.48 Operational devices exception

Sections 13.24(2), 13.25 and 13.26 do not apply to mobile elevating work platforms when they are used in orchards at a height of 3.6 m (12 ft) or less.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 422/2004, effective January 1, 2005.]

28.49 Pulling loads

When a tractor or other mobile equipment is used for pulling loads,

(a) the point of pull on the tractor or other mobile equipment must be the point specified by the manufacturer's instructions, and

(b) the weight of a load pulled must not exceed that specified by the manufacturer.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

28.50 Transportation of workers

(1) Despite section 16.31 and Part 17 (Transportation of Workers), a worker may be transported on farm land, on mobile equipment not designed for the transportation of workers, if

(a) the worker is safely seated, and

(b) the equipment is not operated at more than 10 km/h (6 mph).

(2) A worker must not ride on

(a) a tongue or drawbar connected to equipment in tandem, or

(b) a bucket, forks or other equipment that pose a risk of injury to the worker.

[Enacted by B.C. Reg. 312/2004, effective January 1, 2005.]

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Part 29 Aircraft Operations

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29.1 Definitions

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

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29.2 Application

This Part applies to the use of aircraft in the workplace.

29.3 Pre-job planning and training

The employer must

(a) provide written safe work procedures for workers who are exposed to hazards from aircraft operations,

(b) ensure that workers are provided with adequate pre-job instruction and that the instruction is documented, and

(c) ensure that workers can demonstrate the ability to safely perform their tasks as required.

29.4 Restricted practices

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

29.5 Communications

(1) The employer must ensure that effective communication between air and ground crews has been established before initiating airlift operations.

(2) If hand signals are used to communicate between air and ground crews

(a) only internationally recognized hand signals may be used,

(b) the designated signaller must be identified to the pilot in command by means of high visibility apparel and position, and

(c) all workers exposed to hazards from the airlifting operation must know and understand the hand signals.

29.6 Aircraft landing areas

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

29.7 Rigging

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

29.8 Notification

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

(1) The employer must ensure that airlifted loads are not flown over workers.

(2) Workers must remain clear and in recognized safe areas when there is a hazard from airlifted loads.

29.10 Traffic control

The employer must ensure that effective traffic control measures are employed as required by Part 18 (Traffic Control) wherever airlifted loads will be flown over travelled roadways.

29.11 Rotorwash

The employer must ensure that helicopter rotorwash will not expose workers to undue risk.

29.12 Unstable materials

The employer must ensure that work areas are planned and maintained to avoid placing workers in hazardous proximity to unstable materials.

29.13 Change in flight path

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

29.14 Manual load release

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

29.15 Maximum load

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

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29.16 Notification

(1) The owner, or the person engaged by the owner to be the prime contractor, must give notice to the Board at least 2 weeks before commencing any operation involving aerial transport of logs or other products made of wood.

(2) The notice must provide the

(b) location, scheduled start date and expected duration of the operation, and

(c) type of logging activity to be done.

29.17 Site supervision

The employer must assign a person on site the responsibility for supervising and coordinating airlift operations.

29.18 Heli-yarding

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

29.19 Drop zone areas

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

29.20 Log loading areas

(1) Log loading areas must be separate from drop zones.

(2) Before accessing loading and drop zone areas, workers must communicate their intentions to aircraft and equipment operators, and get an "all clear" signal to proceed from the operators.

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29.21 Loading pesticides

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

29.22 Hoses under pressure

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

29.23 Flagpersons

A flagperson who may be exposed to pesticide spray or drift must wear protective clothing covering the head, body, hands and feet, and a respirator appropriate for the pesticide being applied.

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

Note: Part 6 (Substance Specific Requirements) provides other requirements for pesticides.

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Part 30 Laboratories

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30.1 Definition

In this Part, *"biological agent"* means a biological agent designated as a hazardous substance under section 5.1.1.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

30.1.1 Application

This Part applies to rooms, buildings or areas in buildings equipped with apparatus, equipment,chemicals or test animals and used for research, quality control, performance of tests, experiments or measurements, photographic development, or the preparation of drugs or other products in the natural sciences.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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30.2 Equipment operation

Operators of laboratory equipment must be adequately instructed and trained in the safe use of laboratory equipment and the precautions to be taken when the equipment is used.

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

* See also section 4.3 of the OHS Regulation.

30.3 Electrical services

30.4 Plumbing

(1) Laboratory water faucets with goosenecks must be protected by vacuum breaks meeting the requirements of *ANSI Standard ANSI/ASSE 1001-1990, Pipe Applied Atmospheric Type Vacuum Breakers*.

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

(3) The location of an in-line vacuum break must be clearly identified.

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

* See also sections 4.3 and 4.4 of the OHS Regulation.

30.5 Fire Protection

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

(2) Suitable fire extinguishers of a size easily handled by laboratory workers must be immediately accessible wherever flammable materials are used or stored.

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

30.6 Guarding

(1) Laboratory equipment which presents a physical hazard to workers must be adequately guarded, shielded or isolated by location.

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

* See Part 10 (De-energization and Lockout) of the OHS Regulation.

(3) Hazards of equipment use must be identified on the equipment.

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

30.7 Equipment ventilation

Laboratory equipment and instruments which may emit harmful quantities of a substance during their operation must be provided with an effective local exhaust ventilation system.

30.7.1 Definitions

In sections 30.8 to 30.11:

"laboratory fume hood" means an enclosed and mechanically ventilated workspace located in a

(a) draw air into the workspace and to prevent or minimize the escape of airborne contaminants out of the workspace, and

(b) allow a worker to conduct physical, chemical and biological manipulations inside the workspace;

"operational face opening" means an opening in a laboratory fume hood through which a worker may conduct work inside the hood;

"sash" means a vertical or horizontal panel on a laboratory fume hood that defines the operational face opening and provides a protective barrierbetween the worker conducting work inside the hood and the contents of the hood.

[Enacted by B.C. Reg. 319/2007, effective February 1, 2008.]

30.8 Laboratory fume hoods

(1) A laboratory fume hood and its related ductwork must be designed, installed and maintained in accordance with the *Industrial Ventilation, A Manual of Recommended Practice*, published by the American Conference of Governmental Industrial Hygienists, as amended from time to time.

(2) A laboratory fume hood must

(a) be connected to a local exhaust ventilation system,

(b) provide average face velocities of 0.4 m/s (80 fpm) to 0.6 m/s (120 fpm) across the operational face opening,

(c) not have face velocities of less than 80% of the average face velocity required in paragraph (b) at any point across its operational face opening, and

(d) not have face velocities of more than 120% of the average face velocity required in paragraph (b) at any point across its operational face opening.

(2.1) A laboratory fume hood must have a sash that is positioned to protect the upper body and face of a worker working in the laboratory fume hood from accidental releases of the contents of the hood while allowing hand and arm access to equipment inside the hood.

(2.2) A laboratory fume hood with a movable sash must be clearly marked to identify the maximum size of the operational face opening that will maintain the average face velocities required in subsection (2) (b).

(2.3) The employer must ensure

(a) that before it is used, a commercially manufactured laboratory fume hood has been certified as being tested by the manufacturer, and

(b) following installation and before it is used, a custom built laboratory fume hood is tested on site by a qualified person.

(2.4) A laboratory fume hood tested under subsection (2.3) must demonstrate containment not greater than the control level of 0.05 ppm when tested under "as manufactured " test conditions in accordance

Laboratory Fume Hoods.

(2.5) The installation of a laboratory fume hood must be certified by a professional engineer.

(3) A laboratory fume hood must be located to prevent cross drafts or other disruptive forces from lowering the air flow across the operational face opening to unacceptable levels.

(4) A laboratory fume hood and its ductwork must be constructed from materials compatible with its use.

(5) A laboratory fume hood that will be or is being used for working with

(a) radioactive material in amounts that exceed the exemption quantity specified by the Canadian Nuclear Safety Commission, or

(b) perchloric acid

must be clearly labelled with applicable restrictions on its use.

(6) A laboratory fume hood must not be used for storage of chemicals unless it is used exclusively for this purpose and is labelled with this limitation.

(7) Controls for the operation of a laboratory fume hood and its service fixtures must be

(a) located on the outside of the laboratory fume hood, and

(b) immediately accessible to the worker conducting work in the laboratory fume hood.

(8) Despite subsection (7), water taps may be located inside a laboratory fume hood if the main shutoff valve for the water is located outside the laboratory fume hood.

(9) Equipment being used in a laboratory fume hood must

(a) be kept at least 15 cm (6 in.) from the operational face opening of the laboratory fume hood, and

(b) not adversely affect airflow into the laboratory fume hood.

(10) Written procedures must be developed and implemented to ensure safe use and operation of a laboratory fume hood.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 319/2007, effective February 1, 2008.]

30.9 Airflow and containment monitoring

(1) Face velocities over the operational face opening of a laboratory fume hood must be quantitatively measured and recorded.

(2) The ability of a laboratory fume hood to

(a) maintain an inward flow of air across the operational face opening, and

(b) contain contaminants

must be assessed and recorded using a smoke tube or other suitable qualitative method.

(3) The actions described in subsections (1) and (2) must be performed

(a) after the laboratory fume hood is installed and before it is used,

(b) at least once in each 12 month period after installation, and

(c) after any repair or maintenance that could affect the air flow of the hood.

(4) If a laboratory fume hood is found to be operating with an average face velocity of less than 90% of the average face velocity required in section 30.8 (2), the employer must immediately take corrective action to bring the average face velocity within the required range of velocities.

(5) Airflow in a laboratory fume hood must be monitored continuously if loss of airflow will result in risk to a worker.

(6) A laboratory fume hood that is being installed must have an alarm capable of indicating when the average face velocity falls below the minimum average face velocity level required in section 30.8 (2) when the hood is in use.

[Enacted by B.C. Reg. 319/2007, effective February 1, 2008.]

30.10 Ducting

(1) Laboratory fume hoods located in the same room or separate rooms may be connected to a common exhaust duct or manifold system if the following conditions are satisfied:

(a) the requirements of section 5.3.2 of *ANSI/AIHA Standard Z9.5-2003, Laboratory Ventilation* are met;

(b) controls to prevent backdrafts and pressure imbalances between rooms are installed;

(c) the ventilation design and installation of the common exhaust duct or manifold system is certified by a professional engineer.

(2) Despite subsection (1), laboratory fume hoods that are or will be used for working with

(a) radioactive materials in amounts that exceed the exemption quantity specified by the Canadian Nuclear Safety Commission, or

(b) perchloric acid

must not be connected to a manifold system.

(3) Ducting used in the installation of a laboratory fume hood must be designed in accordance with established engineering principles.

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

Note: *Industrial Ventilation — A Manual of Recommended Practice,* published by the ACGIH is an acceptable source of established engineering principles.

30.11 Exhaust discharge

Laboratory fume hood local exhaust ventilation systems must discharge to the atmosphere in such a manner that the discharged air will not be recirculated into the laboratory or other work areas.

[Amended by B.C. Reg. 319/2007, effective February 1, 2008.]

30.12 Biological safety cabinets

(1) The limitations of a biological safety cabinet must be clearly posted on the unit and followed by workers.

(2) Biological safety cabinets must be certified by a qualified person at least annually and before use after

(a) initial installation,

(b) change of the HEPA (high efficiency particulate air) filter,

(c) moving of the unit, and

(d) any repair or maintenance that could affect the seal of the HEPA filter.

(3) Certification procedures used for compliance with subsection (2) must meet the requirements of the *National Sanitation Foundation (NSF) Standard 49-2002, Class II (Laminar Flow) Biohazard Cabinetry*, and a record of the results must be maintained.

(4) Recirculation of exhaust air into a workspace from a biological safety cabinet is not permitted where volatile toxic materials or flammable liquids or gases are used in the cabinet, or where volatile radioactive materials are used in amounts that exceed the exemption quantity specified by the Canadian Nuclear Safety Commission.

(5) Repealed. [B.C. Reg. 319/2007, effective February 1, 2008.]

(6) Biological safety cabinets used for handling a biological agent must be operated and ventilated in accordance with the *Laboratory Biosafety Guidelines 3rd edition, 2004*, issued by the Public Health Agency of Canada.

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

[Amended by B.C. Reg. 319/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

30.13 Centrifuges

(1) Centrifuge loads must be balanced by sample distribution.

(2) Aerosol-proof safety heads or cups or other equally effective means to prevent exposure of workers must be used where an aerosol containing a biological agent may be generated, where carcinogens are present or where radioactive samples pose a hazard to workers.

(3) Unless exempted by *CSA Standard C22.2 No. 151-M1986 Laboratory Equipment*, or other standard acceptable to the Board, centrifuge doors must be interlocked to prevent workers accessing spinning rotors.

(4) The interlock required by subsection (3) must prevent the door from opening while the rotor is spinning or cause the rotor to brake if the door is opened, or another equally effective means must be used to prevent a worker from accessing the spinning rotor.

(5) Equipment purchased before April 15, 1998 is exempt from the application of subsection (3) until January 1, 2001.

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

(7) Rotors must be stored in a manner which will prevent them from being damaged.

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

30.14 Procedures

Written safe work procedures must be prepared for hazardous operations, including work methods involving hazardous chemicals, spill response, and handling of a material that contains a biological agent, and workers must be adequately instructed in and follow the procedures.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

30.15 Permitted quantities

Only the minimum necessary amount of biological agents and substances that are combustible, flammable, corrosive, toxic or highly reactive may be kept in the working area of the laboratory.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

30.16 Transport of containers

The transport of containers of flammable, corrosive, toxic or highly reactive substances or biological agents through a laboratory must be done in a manner that will not pose a danger of damage to the containers.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

30.17 Personal protection

(1) A worker must wear protective laboratory clothing in a laboratory where a toxic or radioactive

(1.1) Protective laboratory clothing worn in circumstances referred to in subsection (1) must not

(a) be worn outside an area where a worker is required to wear the protective work clothing, and

(b) be stored in a manner or location that might expose a worker to a hazardous substance

(2) Smoking, eating or drinking is not permitted in any laboratory area.

(3) Food for consumption must not be kept in the laboratory, and laboratory glassware, vessels and containers must not be used to prepare or store food or beverages for consumption.

(4) Substances must not be pipetted by mouth.

(5) If hazardous chemicals or materials are handled, all affected workers must receive instruction and training in the proper handling and disposal of such materials.

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

30.18 Spills and other emergencies

(1) Accidental release or spills of chemicals or other hazardous substances must be controlled immediately, and cleaned up under the supervision of persons knowledgeable in the hazards involved and the precautions to be taken during the cleanup operations.

(2) Personal protective equipment required during emergency cleanup or escape must be kept immediately available.

30.19 Waste disposal

(1) Laboratory waste must be disposed of in a manner which ensures that workers are protected from injury.

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

(3) Before disposal, organic solvents and flammable wastes must be collected in separate, tightly covered containers or in an equally effective manner.

(4) Before disposal, water solutions containing azides must first be inactivated, and contact with heavy metals or other incompatible contaminants must be prevented.

(5) Waste material that contains a biological agent must be collected in separate, tightly covered containers before disposal.

(6) Containers of segregated waste must be clearly identified as to their intended use.

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

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Specific Substances and Procedures

30.20 Explosive and highly reactive materials

(1) Quantities of explosive and highly reactive material available at the workbench or in the work area must be restricted to amounts immediately required for the work day.

(2) Storage facilities for explosive and highly reactive materials must be located and designed so as to prevent risk to workers.

(3) Explosive and highly reactive materials must be stored in a manner free from shock, vibration or other conditions which may compromise the stability of the material.

(4) If due to the nature of the laboratory work, explosions or implosions may result, the laboratory apparatus or equipment involved in such work must be adequately shielded and the operators must be provided with and must wear suitable personal protective devices, and wherever practicable the work must be safely isolated from workers by distance.

30.21 Perchloric acid

(1) Perchloric acid must be used in a fume hood designed exclusively for its use and posted with a notice which

(a) identifies the hood as being for perchloric acid use, and

(b) prohibits the use or storage of combustibles in the hood.

(2) Exhaust ducts must be as short as possible, routed directly outdoors with no interconnections to other exhaust ducts, and provided with washdown facilities.

(3) No more than 6.4 kg (14 lbs) of perchloric acid may be stored in a laboratory unless the laboratory facility consists of several smaller laboratories physically separated as fire compartments meeting the requirements of the *BC Fire Code,* in which case a maximum of 6.4 kg (14 lbs) of perchloric acid may be stored in each laboratory.

(4) Containers of perchloric acid must be stored in such a manner that, in the event of breakage, the spilled acid will not contact flammable materials, wood or similar combustible materials.

(5) Stored perchloric acid must be inspected at least monthly and if any discolouration is noted it must be disposed of immediately and in a safe manner.

(6) Anhydrous perchloric acid may only be used if freshly made, and any unused perchloric acid must be disposed of safely at the end of the experiment or procedure but must not be kept for more than one day.

(7) Direct flames, oil baths and electrical stirring equipment must not be used to heat perchloric acid

(8) Rubber stoppers or equipment with rubber components must not be used with perchloric acid.

(9) Spilled perchloric acid must immediately be neutralized and cleaned up using safe procedures, and waste material from the cleanup must be kept moist, sealed in plastic bags, placed in a separate covered metal waste receptacle and disposed of as soon as possible.

30.22 Picric acid

(1) Solid picric acid must be stored with at least 10% moisture content and regular inspections must be made to ensure that the minimum moisture content is maintained.

(2) Solutions of picric acid must not be allowed to accumulate and dry around cap threads.

(3) Materials suspected of being in an unacceptable condition must be safely handled and disposed of by workers instructed in the applicable hazards, precautions and safe disposal methods.

30.23 Peroxide-forming compounds

(1) Peroxide-forming compounds must be inspected and tested for peroxides regularly after the container is first opened, and records of the tests must be maintained.

(2) Compounds contaminated with peroxide materials must be disposed of using safe work procedures or must be treated chemically to eliminate the peroxides.

Note: Examples of substances that can form explosive conditions upon peroxide formation are provided in the *Laboratory Health and Safety Handbook* published by the Board.

30.24 Cryogenic liquids

(1) Containers used for storage, transport and dispensing of cryogenic liquids must be designed for that purpose.

(2) Indoor dispensing stations and storage locations for cryogenic liquids must be adequately ventilated and monitored to prevent the development of harmful atmospheres.

(3) Dispensing stations and freezers with automatic filling cycles for cryogenic liquids must be posted with a sign identifying the materials, the hazards and the precautions required.

30.25 Sharps

(1) Safe means of handling needles and other sharp materials must be provided and used.

(2) Recapping of needles before disposal is not permitted unless the recapping device is specifically designed for single handed use, or is otherwise safe for use.

30.26 Biological agents and human pathogens

(1) Adequate facilities must be readily available for personal decontamination of workers who come in

(2) Work procedures which may generate aerosols containing a biological agent must be performed only under controlled conditions designed to minimize creation of the aerosols and prevent worker exposure to them.

(3) For Risk Group 2 human pathogens, sealed centrifuge safety heads, rotors or trunnion cups must be opened within a fume hood or biological safety cabinet unless there is a means of visually determining, by use of clear safety caps or other effective means, that no breakage or leaking has occurred.

(4) For Risk Group 3 human pathogens, sealed centrifuge safety heads, rotors or trunnion cups must be loaded and unloaded within a biological safety cabinet.

(5) Work involving Risk Group 4 human pathogens must be done as required by the *Laboratory Biosafety Guidelines 3rd edition, 2004*, issued by the Public Health Agency of Canada.

(6) In this section:

"Risk Group 2 human pathogens" mean the human pathogens that are classified by the Public Health Agency of Canada as Risk Group 2 human pathogens;

"Risk Group 3 human pathogens" mean the human pathogens that are classified by the Public Health Agency of Canada as Risk Group 3 human pathogens;

"Risk Group 4 human pathogens" mean the human pathogens that are classified by the Public Health Agency of Canada as Risk Group 4 human pathogens

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

[Amended by B.C. Reg. 312/2010, effective February 1, 2011.]

30.27 Animal handling

(1) Animal quarters and handling areas must be maintained in a clean, hygienic state.

(2) Work procedures and handling methods must be designed to control the spread of aerosols.

(3) Animal health must be monitored by qualified personnel and quarantine measures must be taken as required for infected animals.

(4) Appropriate handling and restraint equipment must be available to workers, and workers must use this equipment, as required, to prevent injury due to bites or other accidents.

(5) Workers must be instructed and trained in effective animal handling techniques.

30.28 Microtomes

Microtome blades must be stored in a safe manner with the blade edge guarded.

30.29 Electrophoresis

(1) Electrophoresis equipment must be designed and maintained so that [illegible]

shut off when the cover is opened.

(2) Equipment must display a label warning workers of the electrical hazard, and all high voltage components must be guarded to prevent worker contact.

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Part 31 Firefighting

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31.1 Definitions

In this Part

"emergency incident" means a specific emergency operation of a fire department or industrial fire brigade;

"fire chief" means the highest ranking person in charge of a fire department or industrial fire brigade;

"fire department" means a fire brigade operated as a public service by an employer specified in clause (c) of the definition of "worker" in section 1 of the *Workers Compensation Act*;

"firefighter" means any worker employed in firefighting, fire inspection, fire investigation, the maintenance of firefighting equipment, the training for and direction of those activities, or other similar duties;

"firefighting vehicle" means an emergency vehicle used for firefighting;

"incident commander" means the firefighter in overall command of an emergency incident;

"industrial fire brigade" means an organization established by an employer to protect the employer's premises where the nature of the business creates specific hazards for which specialized training and equipment is required;

"structure" means a building, vehicle, vessel or similar enclosed location.

31.2 Application

This Part applies to employers and to workers who are employed in firefighting activities on a full or part time basis, including volunteer firefighting in municipal service and industrial fire brigades under Part 1 of the *Workers Compensation Act,* but does not apply to forest fire fighting.

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31.3 Health and safety committee

(1) If an employer is required under Part 3 of the *Workers Compensation Act* to establish a joint commitee or worker health and safety representative, then a fire department or industrial fire brigade operated by the employer must have a separate joint committee or worker health and safety representative, as applicable.

(2) Subsection (1) does not affect any obligation to have a workplace health and safety program for the whole of the employer's operations.

31.4 Instruction and direction

The employer must ensure the adequate instruction and direction of firefighters in the safe performance of their duties.

31.5 Procedures

(1) Written procedures must be established and followed by a fire department or industrial fire brigade to

(a) manage and track firefighters at an emergency incident,

(b) manage exposure to bloodborne pathogens,

(c) manage stress arising from an emergency incident that is likely to cause adverse health effect to

firefighters,

(d) provide for effective traffic control at emergency incidents, and

(e) operate firefighting vehicles during emergency and non-emergency travel.

(2) Written procedures must be established and followed by a fire department or industrial fire brigade for the following situations, where applicable:

(a) fires in buildings 7 storeys or over;

(b) firefighting over water and underground;

(c) fires and other emergency incidents involving hazardous substances;

(d) rescue from high angles, confined spaces, trenches, excavations and water;

(e) disaster planning and response;

(f) electrical emergencies.

31.6 Rest and rehabilitation

The incident commander must make suitable provision for rest and rehabilitation for firefighters at an emergency incident.

31.7 Impounding equipment

If, in the course of an emergency incident, a firefighter suffers serious injury or death, or is involved in an accident involving a risk of serious injury or death, the senior firefighter present must immediately impound the protective and other equipment used by the firefighter and keep the equipment out of service until released by the Board.

31.8 Equipment defects

The employer must, without delay, notify the Board of any structural failure or manufacturing defects detected in a firefighting vehicle, apparatus, or other emergency equipment referred to in this Part.

31.9 Test records

The employer must keep the test and inspection records required by this part available at the workplace for inspection by an officer or the joint committee or worker health and safety representative, as applicable.

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31.10 General requirement

Firefighters must wear personal protective clothing and equipment appropriate to the hazards to which they may be exposed.

31.11 Maintenance

(1) The employer must have written procedures for the inspection of protective clothing and equipment at regular intervals.

(2) Procedures for cleaning and drying protective clothing must be in accordance with the manufacturer's instructions.

(3) Defective items of protective clothing or equipment must be repaired or replaced.

31.12 Firefighter responsibility

Firefighters must ensure that the personal protective clothing and equipment used by them is maintained in good condition.

31.13 Safety headgear

(1) Safety headgear must be worn by firefighters required to approach the seat of a fire or enter a structure or other hazardous area during an incident.

(2) Safety headgear must meet the requirements of *NFPA 1972, Helmets for Structural Firefighting: Structural Fire Fighters Helmets, 1992 Edition*.

(3) Headgear meeting the requirements for safety headgear in Part 8 (Personal Protective Clothing and Equipment) may be used by firefighters

(a) while determining the cause of fires, or carrying out duties associated with preventing fires, or

(b) at the discretion of the incident commander, while fighting a fire in vegetation that is not within a structure.

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

* See also section 4.4 of the OHS Regulation.

31.14 Protective coats, pants and hoods

Firefighters required to approach the seat of a fire or enter a structure or other hazardous area during an incident must wear protective coats, pants and hoods meeting the requirements of

(a) *NFPA 1971, Protective Clothing for Structural Fire Fighting, 1991 Edition,* or

(b) *CGSB Standard CAN/CGSB-155.1-M88, Firefighters' Protective Clothing for Protection Against Heat and Flame.*

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

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

* See section 4.4 of the OHS Regulation.

31.15 Stationwear and personal garments

Firefighters required to approach the seat of a fire or enter a structure or other hazardous area during an emergency incident must not wear shirts, trousers, jackets or coveralls that have poor thermal stability or that ignite easily.

31.16 Working gloves

Firefighters required to approach the seat of a fire or enter a structure or other hazardous area during an emergency incident must wear gloves meeting the requirements of *NFPA 1973, Gloves for Structural Fire Fighting, 1988 Edition*.

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

* See also section 4.4 of the OHS Regulation.

Note: See Part 19 (Electrical Safety) for personal protective equipment and other safety measures required for work involving electrical hazards.

31.17 Fall protection

(1) A firefighter working on an aerial ladder must wear a safety belt and lanyard meeting the requirements of *CSA Standard Z259.1-95, Safety Belts and Lanyards*, and the securing lanyard must limit a fall to no more than 30 cm (12 in).

(2) A firefighter located on an aerial platform must wear a full body harness and lanyard meeting the requirements of Part 11 (Fall Protection).

(3) Rescue ropes, rappelling lines and safety belts and harnesses including safety hooks, rope grabs, lowering devices, and related equipment must meet the requirements of *NFPA 1983, Fire Service Life Safety Rope, Harness and Hardware, 1990 Edition*.

(4) The incident commander may depart from the requirements of Part 11 (Fall Protection) to use a fall protection system if, in the incident commander's opinion, such compliance is not practicable or may create a greater hazard, but subsections (1) to (3) of this section must be complied with.

* See also section 4.4 of the OHS Regulation.

31.18 Personal alert safety system

(1) A firefighter must be provided with and use a Personal Alert Safety System (PASS) when involved in duties which require a self- contained breathing apparatus to be worn.

(2) A PASS device must meet the requirements of *NFPA 1982, Personal Alert Safety Systems (PASS) for Fire Fighters, 1993 Edition*.

(3) A PASS device must be tested at least weekly and prior to use.

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

* See also sections 4.3 and 4.4 of the OHS Regulation.

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31.19 General

Firefighters who may be exposed to an oxygen deficient atmosphere or to harmful concentrations of air contaminants must wear a self-contained breathing apparatus of a positive pressure type having a rated minimum duration of 30 minutes.

31.20 Fitness to use SCBA

A physician's certificate of fitness to use self-contained breathing apparatus must be provided to the employer by a firefighter who

(a) experiences breathing difficulty while using the apparatus, or

(b) is known to have heart disease, impaired pulmonary function, or any other condition that might make it dangerous for the firefighter to use self-contained breathing apparatus.

31.21 Operation of SCBA

Respirators must be used in accordance with *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*, Clause 9.1.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]
[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

31.22 Sealing and fit testing

(1) Firefighters who use a self-contained breathing apparatus must be clean shaven to ensure that the mask forms a positive seal against the face.

(2) Fit tests must be performed in accordance with procedures in *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

(2.1) A fit test must be carried out

(a) before initial use of a respirator,

(b) at least once a year,

(c) whenever there is a change in respirator facepiece, including the brand, model, and size, and

(d) whenever changes to the user's physical condition could affect the respirator fit.

(3) Personal protective equipment that is worn with self-contained breathing apparatus and might interfere with a proper fit must be worn during the fit test.

(4) Only corrective eyewear designed for use with self-contained breathing apparatus may be worn.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]
[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

31.23 Entry into buildings

(1) When self-contained breathing apparatus must be used to enter a building, or similar enclosed location, the entry must be made by a team of at least 2 firefighters.

(2) Effective voice communication must be maintained between firefighters inside and outside the enclosed location.

(3) During the initial attack stages of an incident at least one firefighter must remain outside.

(4) A suitably equipped rescue team of at least 2 firefighters must be established on the scene before sending in a second entry team and not more than 10 minutes after the initial attack.

(5) The rescue team required by subsection (4) must not engage in any duties that limit their ability to make a prompt response to rescue an endangered firefighter while interior structural firefighting is being conducted.

31.24 Air quality and sampling

(1) The employer must ensure that air used for breathing purposes meets the requirements of *CSA Standard CAN/CSA-Z180.1-00, Compressed Breathing Air and Systems*.

(2) The air must be tested at least once annually in a manner acceptable to the Board.

[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

31.25 Spare equipment

(1) When self-contained breathing apparatus are used, the employer must ensure there are at least 4 apparatus available.

(2) At least one spare compressed air cylinder, having a rated minimum duration of 30 minutes, must be maintained at full rated capacity and available for each self-contained breathing apparatus.

31.26 Maintenance and records

(1) Self-contained breathing apparatus, including regulators, must be serviced and repaired by qualified persons.

(2) Inspection of compressed air cylinders must be done in accordance with *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

(3) Compressed air cylinders must be hydrostatically tested in accordance with *CSA Standard CAN/CSA-B339-96, Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods*.

(4) Complete maintenance and repair records for each self-contained breathing apparatus and all air cylinders must be kept in accordance with the requirements of *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators* (section 10.3.3.2.2-b to f, inclusive).

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

[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]

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31.27 Seating

(1) Firefighters being transported by firefighting vehicles must ride in properly secured seats equipped with seat belts and providing not less than 41 cm (16 in) seating width for each occupant.

(2) The seats of all new firefighting vehicles ordered after April 15, 1998 must be equipped with headrests or other effective whiplash protection.

31.28 Communication

Every [illegible] firefighting vehicle must have an effective means of voice communication between the

driver and passengers.

31.29 Enclosed crew cabs

(1) Enclosed crew cabs on firefighting vehicles must be equipped with interior lights, and adequately ventilated.

(2) New firefighting vehicles ordered after April 15, 1998 must have fully enclosed crew cabs meeting the requirements of *NFPA 1901, Automotive Fire Apparatus, 1991 Edition*.

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

* See also section 4.4 of the OHS Regulation.

31.30 Stowing equipment

All equipment on a firefighting vehicle must be adequately secured.

31.31 Safe movement of vehicles

A firefighting vehicle must not be moved if the vision of the driver is obscured, except on a signal from a designated person, who must ensure that the vehicle can be moved safely.

31.32 Vehicle exhaust in firehalls

Unless air monitoring shows that levels of vehicle exhaust gas components are below the exposure limits established under section 5.48, effective local venting for the exhaust gases must be provided in vehicle areas in firehalls.

[Amended by B.C. Reg. 315/2003, effective October 29, 2003.]

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31.33 General

An aerial device used for firefighting must meet the requirements of *NFPA 1904, Aerial Ladder and Elevating Platform Fire Apparatus, 1991 Edition*.

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

* See also section 4.4 of the OHS Regulation.

31.34 Nondestructive testing

(1) A fire department aerial device must be inspected and tested in accordance with good engineering practice at intervals not exceeding 12 months, and certified as safe for use by a professional engineer or the equipment manufacturer.

(2) The inspection and testing of a fire department aerial device must be done in accordance with the requirements of *NFPA 1914, Testing Fire Department Aerial Devices, 1991 Edition*.

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

* See also section 4.4 of the OHS Regulation.

31.35 Controls

The turntable on an aerial device must be fitted with a positive locking device to hold it in any desired position.

31.36 Operator location

During the operation of an aerial device an operator must be present at the lower controls in sight of and in voice contact with any firefighters upon the device.

31.37 Ground ladders

(1) A ground ladder used by firefighters must meet the requirements of *NFPA 1931, Design of and Design Verification Tests for Fire Department Ground Ladders, 1989 Edition*.

(2) A ground ladder must be used, tested and maintained in accordance with the requirements of *NFPA 1932, Use, Maintenance, and Service Testing of Fire Department Ground Ladders, 1989 Edition*.

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

* See also section 4.4 of the OHS Regulation.

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31.38 Flashlights and hand lanterns

Battery operated flashlights and hand lanterns that are CSA approved for hazardous locations classified under the *CSA Standard C22.1-94, Canadian Electrical Code Part 1*, as Class 1, Division 2, Groups A

(a) one flashlight for each firefighter;

(b) at least 4 hand lanterns for each firefighting vehicle.

31.39 Plaster hooks and pike poles

Plaster hooks and pike poles must be fitted with electrically non-conductive shafts.

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Part 32 Evacuation and Rescue

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32.1 Risk assessment

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

* See section 4.13 of the OHS Regulation.

32.2 Training

(2) The training program must include simulated rescue or evacuation exercises and regular retraining, appropriate to the type of rescue or evacuation being provided, and training records must be kept.

32.3 Equipment

(1) Workers performing rescue or evacuation must wear personal protective clothing and equipment appropriate to the hazards likely to be encountered.

(2) Harnesses must meet the requirements of the applicable standards or code issued by the International Union of Alpinist Associations, National Fire Protection Association or Canadian Standards Association.

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

(4) When a platform suspended from a crane or hoist or attached to a crane boom is used for rescue, an injured worker on the platform is not required to use a personal fall protection system, if

(a) the worker is belted to a stretcher and the stretcher is securely fastened to the platform floor, and

(b) the platform has a safety strap that will prevent the platform from falling more than 15 cm (6 in) if the platform becomes dislodged from the hook.

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

* See also sections 4.3 and 4.4 of the OHS Regulation.

32.4 Ropes

(1) Ropes and associated rigging equipment used only for rescue or evacuation or training in such procedures must

(a) be of low stretch (static) kernmantle construction or equivalent,

(b) when new, have a minimum safety factor of 10 to 1, based upon a one-person load of 140 kilograms (300 pounds), and

(c) be replaced at intervals stated by the manufacturer, but not exceeding 5 years.

(2) A worker suspended on a rope for rescue purposes other than from a helicopter must where practicable be secured to an independent lifeline or belay line.

Note: Ropes used for purposes other than just rescue are required to meet the applicable requirements provided in the other parts of this Regulation. For example, Part 11 addresses ropes used for fall protection and work positioning; Part 15 addresses rigging.

32.5 Inspection of equipment

(1) Ropes and associated equipment must be inspected visually and physically by qualified workers after each use for rescue, evacuation or training purposes.

(2) Equipment must not be used after it

(a) has been overstressed,

(b) has been subject to temperatures above 150°C (300°F), or

(c) shows significant damage due to contact with chemicals or due to any other cause.

32.6 Maintenance records

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

(2) Maintenance records must be kept, including but not limited to

(a) the name of manufacturer,

(b) the type of equipment,

(c) the date put into service,

(d) when and for what purpose the equipment has been used,

(e) the date of the last inspection and name of the inspecting person,

(f) any damage suffered, and

(g) the date and nature of any of maintenance.

(3) Maintenance records must be available upon request to any worker concerned with the safe operation of the equipment or to an officer.

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

* See section 4.3 of the OHS Regulation.

32.7 First aid

At least one member of a rescue team must be a first aid attendant trained to immobilize an injured worker.

[Amended by B.C. Reg. 348/2003, effective March 30, 2004.]

32.8 Communications

Effective communications must be maintained between the workers engaged in rescue or evacuation and support persons.

32.9 Work areas over water

guardrails or other means of fall protection permitted by this Regulation, the employer must provide

(a) a suitable rescue boat, equipped with a boat hook, available at the site and capable of being used for rescue at all times,

(b) a buoyant apparatus attached to a nylon rope not less than 9 mm (3/8 in) in diameter, and not less than 15 m (50 ft) in length, and

(c) a sufficient number of workers who are available when work is underway to implement rescue procedures and who are properly equipped and instructed in those procedures.

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Part 34 Rope Access

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34.1 Definitions

In this Part:

"anchor", also known as an anchorage connector, means a component or subsystem of a rope access system used to connect other parts of the rope access system to an anchorage;

"anchorage" means anything to which an anchor can be connected or secured, including a building, structure, tree or rock;

"full body harness" means a body support device

(a) consisting of connected straps designed to distribute the forces resulting from the suspension or fall of a person over at least the person's thighs, shoulders and pelvis, and

(b) with provision for connecting a lanyard, a rope or other components;

"lanyard" means a flexible length of rope that is used to connect a sit harness or full body harness to other parts of a rope access system or to an anchorage;

"rope" means a length of cord or webbing made of parallel, twisted or braided synthetic fibres or steel wire;

"rope access" means a technique in which a rope access system is used to provide a person with access to and from a workplace, commonly including suspension at the workplace, in such a way that a fall is prevented or arrested;

"rope access system" means a system consisting of

(a) a sit harness or full body harness,

(b) rope, lanyards and other connecting equipment,

(c) anchors, and

(d) other components such as ascenders, descenders, belay devices, backup devices and fall arresters,

that usually employs 2 separately secured subsystems, one as a means of access and the other as a safety, secondary, belay or backup system, but does not include a boatswain's chair, also known as a bosun's chair, or a zipline;

"sit harness" means a body support device consisting of thigh and waist loops.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.2 Scope of application

(1) Subject to subsection (2), this Part applies to the use of rope access in a workplace.

(2) This Part does not apply to the following:

(a) scaling operations described in sections 20.96 to 20.101;

(c) firefighters and firefighting activities under Part 31;

(d) evacuation and rescue, and training in such procedures, under Part 32.

(3) The use of rope access in a workplace is subject to section 11.2.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.3 Rope access plan

(1) Before a rope access system is installed or used in a workplace, a written rope access plan must be prepared and be available at the workplace.

(2) The rope access plan must include all of the following information:

(a) the hazards associated with the work to be performed;

(b) how the hazards and associated risks will be eliminated or controlled;

(c) a description of the rope access system to be used at the workplace;

(d) a description of the types and locations of anchorages to be used at the workplace;

(e) the procedures to be used to assemble, maintain, inspect, use and disassemble the rope access system;

(f) the name and duties of each member of the work team;

(g) the appropriate personal protective equipment to be used;

(h) the emergency response, evacuation and rescue procedures.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.4 Training and certification

(1) Before allowing a person to perform rope access, the employer must ensure and document that the person

(a) has received training in the safe use of a rope access system, including, as appropriate to the work being done, the safe work practices, skills and practical experience hours described in one of the following groups of publications:

(i) *International Code of Practice* (2013) and *General requirements for certification of personnel engaged in industrial rope access methods*, Edition 6 (June 2009), published by the International Rope Access Trade Association;

(ii) *Safe Practices for Rope Access Work* (August 2012) and *Certification Requirements for Rope Access Work* (November 2012), published by the Society of Professional Rope Access Technicians;

(iii) *Scope of Practice* (2012), *Technical Handbook for Professional Mountain Guides* (1999) and

Guides;

(iv) *Cave Guiding Standards for British Columbia and Alberta* (January 2004), published by the Canadian Cave Conservancy, and *Companion Rescue Workshop* (2011), published by British Columbia Cave Rescue, and

(b) holds a valid certificate of the training referred to in paragraph (a) issued by a body or association referred to in subparagraphs (i) to (iv) of that paragraph.

(2) The certificate referred to in subsection (1)(b) must be available at the workplace and produced for inspection on the request of an officer.

(3) Before allowing a person to perform rope access, the employer must ensure and document that the person is trained in the rope access plan and knows that person's duties under the plan.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.5 Safe work practices

A person performing rope access must comply with, as appropriate to the work being done, the safe work practices described in one of the groups of publications set out in section 34.4(1)(a)(i) to (iv).

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.6 Two-rope system

(1) In this section, *"two-rope system"* means a rope access system that includes a working line and a safety, secondary, belay or backup line.

(2) A person performing rope access must use a two-rope system unless one or both of the following apply:

(a) the primary means of support for the person performing rope access is provided by a building, a structure or the ground and not by a rope access system;

(b) in the case of rope access performed

(i) in the course of mountaineering or caving, or

(ii) in a climbing gym,

using a two-rope system may result in a greater hazard than if a single-rope system is used.

(3) In a two-rope system, the working line and the safety, secondary, belay or backup line must

(a) have independent connection points to the system's anchor or anchorage, and

(b) be independently connected to the harness of the person performing rope access.

(4) For the purposes of subsection (3)(b), the working line and the safety, secondary, belay or backup line

rope access.

(5) A person must not connect a safety, secondary, belay or backup line to a sternal connection point on the person's full body harness except as permitted by the manufacturer of the harness.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

34.7 Personal log

(1) A person who performs rope access must maintain a personal log containing a record of the rope access performed by the person.

(2) The records in the personal log must be kept in chronological order and, unless otherwise provided for in a group of publications set out in section 34.4(1)(a)(i) to (iv) that is appropriate to the work being done, the entry for each day of work must be verified and signed by the rope access supervisor or the manager in charge.

(3) The records in the personal log must include all of the following information:

(a) the date on which the rope access was performed;

(b) the type of work performed;

(c) the type of rope access system used for the work;

(d) the type of building or structure worked on;

(e) the number of hours worked using rope access.

(4) The person must keep the personal log current and available at the workplace for inspection by an officer.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

34.8 Rescue

The employer must ensure that a person performing rope access can be promptly rescued, in accordance with the procedures described in the rope access plan referred to in section 34.3(1), in the event of an equipment malfunction, a fall or an injury or the person's incapacity to self-rescue.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

34.9 Equipment

(1) Equipment used for a rope access system must

(a) consist of components that are compatible and suitable for the intended use, and

(b) be suitable for the environment in which the equipment is used.

(2) Unless otherwise provided for under section 34.12(1) or 34.13(2), equipment of a type set out in Column 1 of Schedule 34-A must meet the requirements of, and be used in accordance with, one of the applicable standards set out opposite that type of equipment in Column 2.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.10 Inspection and maintenance

Equipment used for a rope access system must be

(a) inspected for defects by a person intending to use the rope access system before the rope access system is first used on each work shift,

(b) inspected in the manner and at the frequency required by the manufacturer of the equipment, and

(c) kept free from substances and conditions that could contribute to the deterioration of the equipment.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.11 Anchors and anchorages

(1) An anchor for a rope access system must be reliable.

(2) A person must not connect or secure a rope access system to an anchorage unless the anchorage is reliable and capable of safely withstanding any forces that may be applied to the anchorage by persons using the rope access system.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.12 Permanent anchors

(1) A permanent anchor for a rope access system must have an ultimate load capacity, in any direction in which the load may be applied, of at least 22.2 kN (5000 lbf) for each person connected to the permanent anchor.

(2) In addition to the requirement under section 34.10 (b) and in accordance with sections 7.3.2, 7.3.3 and 7.4, as applicable, of *CSA Standard Z91-02 (R2013) Health and Safety Code for Suspended Equipment Operations*,

(a) a permanent anchor for a rope access system must be inspected, at least once a year, and tested, and

(b) the results of the inspection and testing must be documented.

(3) A permanent anchor for a rope access system, and its installation, must be certified by a professional engineer.

(4) Subsections (2) and (3) do not apply to a permanent anchor for a rope access system used in the course of mountaineering or caving.

NEW

34.13 Temporary anchors

(1) In this section, *"temporary anchor"* means an anchor that is removed from service immediately after use.

(2) A temporary anchor for a rope access system must have an ultimate load capacity, in any direction in which the load may be applied, of at least 12 kN (2700 lbf) for each person connected to the temporary anchor.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

34.14 Safety headgear

Despite section 8.11, a person performing rope access must wear headgear that

(a) is appropriate for the work being done,

(b) is equipped with a chin strap having at least 3 separate points of connection to the helmet shell,

(c) is secured in accordance with the specifications of the manufacturer of the headgear, and

(d) meets the requirements of one or more of the following standards:

(i) *CAN/CSA-Z94.1-05 Industrial Protective Headwear — Performance, selection, care, and use* (published February 2005);

(ii) *ANSI/ISEA Z89.1-2009 American National Standard for Industrial Head Protection* (published January 26, 2009);

(iii) *EN 12492:2012 Mountaineering equipment. Helmets for mountaineers. Safety requirements and test methods* (published August 31, 2012);

(iv) *EN 397:2012+A1:2012 Industrial safety helmets* (published April 30, 2013);

(v) *UIAA 106 Mountaineering and Climbing Equipment — Helmets* (published January, 2009).

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

NEW

3.15 Maximum arrest force, clearance

(1) In this section, *"maximum arrest force"* means the peak shock load that a rope access system imposes on the body of a person connected to the rope access system when stopping the person's fall.

(2) A rope access system must

(a) limit the maximum arrest force to not more than 6 kN (1350 lbf), and

(b) minimize the risk of a person connected to the rope access system striking a lower surface or object, or swinging and striking a surface or object, in a manner that could cause injury.

NEW

34.16 Removal from service

(1) Equipment used for a rope access system must be removed from service

(a) as specified by the manufacturer of the equipment, or

(b) if the equipment is defective.

(2) Equipment that is removed from service must not be returned to service until it has been inspected and recertified, by the manufacturer or a professional engineer, as meeting the requirements of section 34.9.

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

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Schedule:34-A
Standards for Equipment Used in Rope Access Systems

Column 1 Type of Equipment	Column 2 Standards
Anchors	*CAN/CSA Z259.15-12 Anchorage Connectors* (published January, 2012)
	CAN/CSA Z271-10 Safety code for suspended platforms (published September, 2010)
	EN 795:2012 Personal fall protection equipment — Anchor devices (published September 30, 2013)
Connectors	*ANSI/ASSE 359.12-2009 Connecting Components for Personal Fall Arrest Systems* (published November 16, 2009)
	CSA Z259.12-11 Connecting components for personal fall arrest systems (PFAS) (published November, 2011)
	EN 362:2004 Personal protective equipment against falls from a height — Connectors (published June 30, 2005)
	EN 12275:2013 Mountaineering equipment — Connectors — Safety requirements and test methods (published October 31, 2013)
	UIAA 121 Mountaineering and Climbing Equipment — Connectors/Karabiners (published March 8, 2013)

Energy absorbers	*EN 355:2002 Personal protective equipment against falls from height — Energy absorbers* (published November 30, 2002)
Harnesses	*CAN/CSA Z259.10-12 Full body harnesses* (published February, 2012)
	EN 361:2002 Personal protective equipment against falls from a height — Full body harnesses (published July 4, 2002)
	EN 813:2008 Personal fall protection equipment — Sit harnesses (published February 28, 2009)
	EN 12277:2007 Mountaineering equipment — Harnesses — Safety requirements and test methods (published August 31, 2007)
	UIAA 105 Mountaineering and Climbing Equipment — Harnesses (published May 30, 2014)
Lanyards	*EN 354:2010 Personal fall protection equipment — Lanyards* (published January 31, 2011)
Rope	*Cordage Institute CI 1801-07 Low Stretch and Static Kernmantle Life Safety Rope* (published October, 2007)
	EN 892:2012 Mountaineering equipment — Dynamic mountaineering ropes — Safety requirements and test methods (published February 28, 2013)
	EN 1891:1998 Personal protective equipment for the prevention of falls from a height — Low stretch kernmantel ropes (published October 31, 1998)
	NFPA 1983 Standard on Life Safety Rope and Equipment for Emergency Services, 2012 Edition (published January 2, 2012)
	UIAA 101 Mountaineering and Climbing Equipment — Dynamic Ropes (published June 26, 2014)
	UIAA 107 Mountaineering and Climbing Equipment — Low Stretch Ropes (published March 8, 2013)
Rope adjustment devices, including ascenders, back up devices, belay devices, descenders, fall arresters and rope clamps.	*CAN/CSA Z259.2.3-12 Descent devices* (published January, 2012)
	EN 341:2011 Personal fall protection equipment — Descender devices for rescue (published December 31, 2011)
	EN 353-2:2002 Personal protective equipment against falls from a height — Part 2: Guided type fall arresters including a flexible anchor line (published November 30, 2002)
	EN 567:2013 Mountaineering equipment — Rope clamps — Safety requirements and test methods (published September 30, 2013)
	EN 12841:2006 Personal fall protection equipment — Rope access systems — Rope adjustment devices (published February 28, 2007)
	UIAA 126 Mountaineering and Climbing Equipment — Rope Cl

	(published March 8, 2013)

[Enacted by B.C. Reg. 199/2014, effective February 1, 2015.]

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