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G20.1 Construction project – Routine maintenance

Issued August 1999; Editorial Revision June 14, 2013

Regulatory excerpt
Section 20.1 of the *OHS Regulation* ("*Regulation*") states

> *"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;

Purpose of guideline
The purpose of this guideline is to explain what routine maintenance is with respect to a construction project.

Routine maintenance
The definition of a construction project includes reference to "routine maintenance." Routine maintenance includes activities such as painting or glass replacement that are required as part of owning and operating a building or facility. An NOP is not required unless a particular maintenance project triggers one of the criteria listed in section 20.2 of the *Regulation*, for example, if the total cost of a painting project will exceed $100,000.

G20.2(1)/20.2.1(1) Notice of project

Issued August 1999; Editorial Revision October 2004; Editorial Revision February 25, 2013; Formerly issued as part of G20.2(1) – Re-issued as Editorial Revision consequential to May 1, 2017 Regulatory Amendment

Regulatory excerpt
Section 20.2(1) of the *OHS Regulation* ("*Regulation*") states, in part:

> Subject to subsection (4) either the owner or the person engaged by the owner to be the prime contractor on a construction project must ensure that the Board receives, in writing, a notice of project that contains the information required by subsection (2) at least 24 hours before work on the construction project begins at the worksite if any of the following apply
>
> …

Section 20.2.1(1) of the *Regulation* states:

> Subject to subsections (3) and (6), if a construction project involves a work activity set out in subsection (2), all employers responsible for the work activity and either the owner or the person engaged by the owner to be the prime contractor on a construction project must ensure that the Board receives, in writing, a notice of project that contains the information required by subsection (4) at least 48 hours before work activity begins at the worksite.

Purpose of guideline
The purpose of this guideline is to provide information on how to submit a notice of project (NOP) and to explain WorkSafeBC's discretion with respect to site inspections.

Submitting NOPs
NOP forms may be submitted online (preferred method) at https://www.worksafebc.com/en/for-employers/just-for-you/submit-notice-project.

A paper version of the NOP form may also be completed and submitted to WorkSafeBC. The forms can be ordered from WorkSafeBCStore.com.

WorkSafeBC prevention officers and managers monitor the notices regarding activity in their area and select projects for follow-up in accordance with their objectives, the nature of the project or other circumstances. WorkSafeBC is not obliged to initiate a site inspection in every case when an NOP is received.

G20.2(1)(e) Bell holes

Issued August 1999; Editorial Revision January 1, 2009; Formerly issued as part of G20.2(1)(f) – Re-issued as Editorial Revision consequential to May 1, 2017 Regulatory Amendment

Regulatory excerpt
Section 20.2(1)(e) of the *OHS Regulation* ("*Regulation*") states:

> (1) Subject to subsection (4), either the owner or the person engaged by the owner to be the prime contractor on a construction project must ensure that the Board receives, in writing, a notice of project that contains the information required by subsection (2) at

least 24 hours before work on the construction project begins at the worksite if any of the following apply:

…

(e) a worker may be required to enter

(i) A trench over 30 m (100 ft) long, or

(ii) An excavation, other than a trench, over 1.2 m (4 ft) deep.

Purpose of guideline
The purpose of this guideline is to specify when bell holes are considered to be a trench.

Bell holes
Work around underground pipe and conduits usually involves digging "bell holes" for maintenance such as fixing leaks or breaks, or servicing valves. A bell hole is considered to be a trench, as long as the criteria in the definition for a *trench* in section 20.1 of the *Regulation* are met. This means its width at the bottom cannot exceed 3.7 metres (12 feet). If the work related to a bell hole excavation triggers one of the criteria listed in section 20.78 requiring a qualified registered professional or engineer's instructions, or invokes one of the criteria listed in section 20.2, an NOP is required.

G20.2.1(1) and (2) Notice of project for hazardous substances – Ongoing asbestos work

Issued November 19, 2008; Revised consequential to February 1, 2012 Regulatory Amendment; Formerly issued as part of G20.2(1)(c) – Re-issued as Editorial Revision consequential to May 1, 2017 Regulatory Amendment; Editorial Revision November 13, 2020

Regulatory excerpt
Sections 20.2.1(1) and (2) of the *OHS Regulation* ("*Regulation*") state:

(1) Subject to subsections (3) and (6), if a construction project involves a work activity set out in subsection (2), all employers responsible for the work activity and either the owner or the person engaged by the owner to be the prime contractor on the construction project must ensure that the Board receives, in writing, a notice of project that contains the information required by subsection (4) at least 48 hours before the work activity begins at the worksite.

(2) The following are work activities for the purposes of subsection (1):

(a) a work activity that involves working with or in proximity to asbestos-containing material, as defined in section 6.1, that is a moderate risk work activity or a high risk work activity as defined in that section;

(b) the alteration, repair, dismantling or demolition of all or part of a building or structure in which asbestos-containing material has been processed, manufactured or stored;

(c) a work activity that significantly disturbs lead-containing material in buildings or structures;

(d) a work activity that is similar to those described in paragraphs (a) to (c) and that may expose workers to a significant risk of occupational disease from a biological or chemical agent or ionizing radiation.

Purpose of guideline
This guideline outlines the requirements for the submission of a notice of project (NOP-H) specifically in regards to asbestos for short-duration, intermittent repair, maintenance, or clean-up work. The guideline is for use by employers who conduct periodic repairs or other minor disturbances of friable asbestos-containing materials, as part of an ongoing operations and maintenance program, and for certain types of periodic emergency repair or debris cleanup.

Background information
There are situations where an employer may need to conduct a number of jobs that affect asbestos-containing material over an extended period. This is typically routine work, following a set of prescribed procedures for a variety of tasks, performed by assigned staff who are trained and supervised in these procedures. The NOP-H (specific to asbestos) for ongoing work allows the employer to perform this work without submitting a separate NOP each time one of these routine tasks is performed.

When should an NOP-H be submitted?
The *Regulation* requires that an NOP-H be submitted at least 48 hours before beginning a moderate-risk work activity or a high-risk work activity, as defined in section 6.1, involving asbestos-containing material, or the alteration, repair, dismantling, or demolition of all or part of a building or structure where asbestos-containing material has been processed, manufactured, or stored.

NOP-H (specific to asbestos) for ongoing intermittent repair or maintenance work
With the prior permission of WorkSafeBC, an employer may submit a single NOP-H for work with asbestos-containing material that may take place over an extended period of time. This will be of use to employers who conduct periodic minor repairs or other minor disturbances of asbestos-containing materials as part of an ongoing operations and maintenance program, and for certain types of periodic emergency work. An initial ongoing NOP-H will typically be accepted for a period of one year. A subsequent ongoing NOP-H may be accepted for periods of up to

three years.

Permission for an ongoing NOP-H for intermittent repair or maintenance work will normally only be granted for the following:

- Moderate-risk work activity, as defined in *Regulation* Part 6
- Routine work of short duration, not more than one day or one shift at a time
- Work involving a minimal disturbance of asbestos-containing materials (e.g., replacing several loose asbestos floor tiles; drilling a few holes through asbestos-containing drywall mud or floor tile to mount brackets, frames, or to install floor sills; replacing several asbestos-containing ceiling tiles; removing or making minor modifications to asbestos cement products; boiler inspection and/or cleaning; repair of a small section - less than one standard 4 ft. x 8 ft. sheet - of gypsum board that contains asbestos filler compound)
- Periodic emergency cleanup of possible asbestos-containing debris or materials that have been left or dumped inappropriately

An ongoing NOP-H will not be granted for work that includes abatement or demolition of asbestos-containing materials that would normally be performed by an asbestos abatement or restoration contractor.

A request for ongoing NOP-H should include the following information:

- The information required in an NOP as specified in *Regulation* section 20.2.1(4)
- Confirmation that the employer's exposure control plan for asbestos complies with section 5.54 of the *Regulation*
- Evidence of an up-to-date asbestos inventory for the site(s) if applicable
- The site-specific safe work procedures to be used, including maximum quantities
- Confirmation that the procedures will be performed by adequately trained, instructed, and supervised employees of the applicant employer

Application/decision process
For an ongoing NOP-H, the applicant should submit the request to the applicable manager, Prevention Field Services (the Manager) or to Prevention Support Services (PrevNOP@worksafebc.com or fax 604.276.3247). To apply for the ongoing NOP-H, the online NOP form should not be completed.

The Manager will issue a decision in a letter in consultation with a local occupational hygiene officer who may do a site visit and speak with a number of persons as part of the consideration process.

The decision letter may contain special requirements such as the following:

- A log record must be kept of each job performed. The record should include the project location, date, duration, hours of work, number of workers, nature/description of the work (including the amount of material that may be removed or dislodged), and confirmation of the risk level (e.g., moderate risk)
- The log record must be readily available to WorkSafeBC

The Manager will ensure an electronic copy of the decision letter is retained. The employer must ensure the decision letter and NOP-H are available at the worksite during the work activity.

If any of the procedures, terms, or conditions of the NOP-H and the decision letter are not met or followed, the permission may be cancelled and compliance activity undertaken.

G20.2.1(2)(c) Notice of project – Significant disturbance of lead-containing material

Issued consequential to May 1, 2017 Regulatory Amendment; Editorial Revision October 28, 2019

Regulatory excerpt
Sections 20.2.1(1) and (2) of the *OHS Regulation* ("*Regulation*") state:

> (1) Subject to subsections (3) and (6), if a construction project involves a work activity set out in subsection (2), all employers responsible for the work activity and either the owner or the person engaged by the owner to be the prime contractor on the construction project must ensure that the Board receives, in writing, a notice of project that contains the information required by subsection (4) at least 48 hours before the work activity begins at the worksite.
>
> (2) The following are work activities for the purposes of subsection (1):
>
> (a) a work activity that involves working with or in proximity to asbestos-containing material, as defined in section 6.1, that is a moderate risk work activity or a high risk work activity as defined in that section;
>
> (b) the alteration, repair, dismantling or demolition of all or part of a building or structure in which asbestos-containing material has been processed, manufactured or stored;
>
> (c) a work activity that significantly disturbs lead-containing material in buildings or structures;
>
> (d) a work activity that is similar to those described in paragraphs (a) to (c) and that may expose workers to a significant risk of occupational disease from a biological or chemical agent or ionizing radiation.

Purpose of guideline
The *Regulation* specifies a requirement to submit a notice of project (NOP) for certain construction activities if it is anticipated that a work activity will significantly disturb lead-containing material in buildings or structures.

This guideline provides further explanation of the work activities that significantly disturbs lead-containing materials in buildings or structures. Also, this guideline provides examples of work activities that normally would *not* require an NOP form to be submitted.

Significant disturbance of lead-containing materials
An NOP must be submitted for a work activity that significantly disturbs lead-containing materials in buildings or structures associated with a construction project. This lead work activity may expose workers to a significant risk of occupational disease where it generates lead dust, fumes, or mist in the air or on surfaces.

Workers are at significant risk of occupational disease if the following occurs:

- They breathe airborne lead dust, mist, or fumes at or above the action limit (half of the exposure limit for lead)
- There is likelihood of significant contamination of workers' hands and face with lead that there is a high risk the lead could be ingested
- They breathe or ingest enough lead to increase their blood lead body burden above background levels (0.1 micromoles per litre (µmol/L), or 2 micrograms per deciliter (µg/dL)

Section 6.59.1 of the *Regulation* states that an employer must ensure that a risk assessment is completed by a qualified person for the planned lead activity. As part of the risk assessment, the scope, circumstances, and the nature of the work activity, as well as the potential routes of exposure are considered.

The following are some activities that are not expected to cause harm to a worker and would not normally require an NOP to be submitted:

- Conducting a site inspection to identify hazardous materials
- Collecting samples and preparing a written report under section 20.112, hazardous materials
- Determining the types of tasks required for the construction project
- Estimating the cost of labour and materials for the project
- Low risk and some low-moderate and moderate risk work activities that should not increase a worker's lead body burden
  Examples include the following:
  - Light sanding or scraping a small area of lead-containing paint
  - Applying lead-containing paint with a brush roller
  - Installing or removing sheet metal containing lead
  - Installing or removing bolts or screws covered with lead-containing paint
  - Operating an excavator (within the cab) during building demolition
  - Transporting sealed containers of lead waste
  - Cleaning up small areas of lead-containing dust or debris

More information can be found in the WorkSafeBC Publication *Safe Work Practices for Handling Lead*. Further explanation regarding low, low-moderate and moderate risk activities can be found in the WorkSafeBC Publication Safe Work Practices for Handling Lead.

G20.2.1(2)(d) Notice of project – Other similar exposure work activities

Issued August 4, 2015; Formerly issued as part of G20.2(1)(c)(iv) – Re-issued as Editorial Revision consequential to May 1, 2017 Regulatory Amendment

Regulatory excerpt
Sections 20.2.1(1), (2) and (4) of the *OHS Regulation* ("*Regulation*") state:

> (1) Subject to subsections (3) and (6), if a construction project involves a work activity set out in subsection (2), all employers responsible for the work activity and either the owner or the person engaged by the owner to be the prime contractor on the construction project must ensure that the Board receives, in writing, a notice of project that contains the information required by subsection (4) at least 48 hours before the work activity begins at the worksite.
>
> (2) The following are work activities for the purposes of subsection (1):
>
> (a) a work activity that involves working with or in proximity to asbestos-containing material, as defined in section 6.1, that is a moderate risk work activity or a high risk work activity as defined in that section;
>
> (b) the alteration, repair, dismantling or demolition of all or part of a building or structure in which asbestos-containing material has been processed, manufactured or stored;
>
> (c) a work activity that significantly disturbs lead-containing material in buildings or structures;
>
> (d) a work activity that is similar to those described in paragraphs (a) to (c) and that may expose workers to a significant risk of occupational disease from a biological or chemical agent or ionizing radiation.

(4) The notice of project must contain the following information:

(a) the name and contact information of all employers responsible for the work activity, of the owner and of the person engaged to be the prime contractor, if any;

(b) the address of the construction project or its location in relation to the nearest highway;

(c) the scope of the construction project and of the work activity;

(d) the starting date and the estimated duration of the construction project and of the work activity;

(e) the safe work procedures specific to the work activity, and the hazardous substance involved in the work activity, that will be used to minimize the risk of occupational disease to the workers;

(f) if section 20.112 applies, a written report made under section 20.112(3)(e) and, if applicable, section 20.112(6)(e).

Purpose of guideline
The *Regulation* specifies a requirement to submit a notice of project (NOP) for certain construction activities related to asbestos and lead. The *Regulation* also specifies that an NOP must be submitted for similar construction work activities which may expose workers to a significant risk of occupational disease from a biological or chemical agent or ionizing radiation.

This guideline provides examples of other similar exposure work activities which may expose workers to a significant risk of occupational disease and for which an NOP needs to be submitted.

Construction activities and occupational disease
Section 20.2.1(2)(d) of the *Regulation* requires that an NOP be submitted when there are work activities associated with a construction project which may expose workers to a significant risk of occupational disease from a biological or chemical agent or ionizing radiation. Determination of which construction work activities may expose workers to a significant risk of occupational disease includes consideration of the following criteria:

- Workers may be exposed to hazardous substances during a work activity associated with a construction project (including demolition or renovation)
- Abatement or remediation activity is required before demolition or reconstruction can occur
- The activity may involve exposure to unknown, undetermined, or unexpected hazardous substances. For example, there may be unknown hazardous substances used in grow operations and methamphetamine labs, and workers may be exposed to them when demolition or reconstruction takes place
- Emerging knowledge about hazardous substances used during construction activities, e.g., as discovered by WorkSafeBC prevention officers or as published in the literature

The construction activities listed below may expose workers to a significant risk of occupational disease. For these activities, an NOP must be submitted at least 48 hours before starting the project and a copy of the NOP must be posted at the construction site before work commences.

Notices of project for these activities can be submitted online from the WorkSafeBC NOP webpage (preferred method). A paper version of the Notice of Project (NOP) for Construction Projects involving asbestos, lead, or other similar exposure work activity (Form # 52E49) can also be used. Guidance for submitting the NOP can be found in OHS Guideline G20.2(1) Notice of Project. Refer to the *Regulatory excerpt* section of this guideline for a list of the information that must be included in a submitted NOP, including safe work procedures specific to the work activity and, if applicable, the written report made under section 20.112(3)(e) or 20.112(6)(e).

Other similar exposure construction work activities that require a notice of project to be submitted under this *Regulation* section
In addition to the requirements in section 20.2.1(2)(a), (b), and (c) of the *Regulation* for an NOP to be submitted for asbestos and lead-related construction activities, section 20.2.1(2)(d) of the *Regulation* requires that an NOP be submitted for at least the following construction activities:

1. Remediation of indoor marijuana-growing operations
Marijuana-growing operations use potentially hazardous chemicals, including fertilizers and pesticides. Significant mould growth can also be associated with these operations. Remediation of these operations will usually involve demolition and/or reconstruction and is considered to be construction activity.

When these facilities are investigated and eventually cleaned up, workers may be exposed to harmful levels of these substances.

An NOP must be submitted for any work involving the abatement, cleanup, or demolition of indoor marijuana-growing operations.

2. Remediation of clandestine chemical labs
During the production of illegal drugs, such as methamphetamines, a number of hazardous substances may be used, including phosphorous, iodine, ammonia, hydrochloric acid, lead, mercury, and other chemicals. These are in addition to the drugs themselves. When these facilities are investigated and eventually cleaned up, workers may be exposed to harmful levels of these chemicals.

An NOP must be submitted for work involving the abatement, cleanup, or demolition of clandestine chemical labs.

3. Mould remediation
Mould contamination may be obvious on walls, furnishings, and equipment or may be hidden behind walls, in conduits and chases, etc.

A worker's exposure to moulds is primarily through inhalation of airborne spores that cannot be seen without magnification. These spores can be released in very high concentrations if mouldy building material is disturbed, such as during remediation or demolition activities.

All moulds have the potential to cause health effects. Moulds produce allergens, irritants, and in some cases toxins that may cause reactions in humans. For a worker who has a compromised or sensitized immune system, health effects can be severe. For those individuals, exposure to pathogenic moulds or their toxic by-products may be associated with a variety of adverse health effects, including allergic reactions, asthma, pneumonitis with flu-like symptoms, infections of the upper airways, sinusitis, or other lung diseases.

An NOP must be submitted for work involving the remediation, cleanup, or demolition of mould-contaminated areas where the total surface area affected is greater than 10 contiguous square metres (100 contiguous square feet). Refer also to OHS Guideline G4.79 Moulds and Indoor air quality. Also, Health Canada advises that professional assistance should be sought for remediation of these large mould problems.

4. Ionizing radiation
Ionizing radiation is a hazardous form of energy emitted by radioactive substances or generated by x-ray equipment. Ionizing radiation can be in the form of particles (e.g., neutrons, beta, alpha) or electromagnetic waves (e.g., gamma, X-rays).

Depending on the dose of radiation received, exposure to ionizing radiation can cause adverse health effects, such as radiation burns, acute radiation syndrome, and cancer to various tissues and organs.

Some construction-related work activities may expose workers to elevated levels of ionizing radiation that can lead to significant risk of occupational disease.

An NOP must be submitted for construction project work activities where workers may be exposed to ionizing radiation above the action level - effective dose of 1 milliSievert (mSv) per year, as defined in the *Regulation* section 7.17.

Some examples of construction work activities where workers' effective dose may exceed the action level of 1 mSv per year are as follows:

- Some types of non-destructive tests (e.g., industrial radiography using radioactive sources such as cobalt-60, iridium-192)
- Demolition or significant disturbance of building materials or structures that contain radioactive substances (e.g., uranium-containing glazed tiles emitting ionizing radiation, construction sites that require the removal or remediation of radioactive wastes from buildings or structures)
- Removal of significant quantities of industrial/commercial devices and equipment containing radioactive sources (e.g., some commercial smoke detectors containing Am-241)

An employer is required to determine if a worker's exposure to ionizing radiation from the planned work activity will be over the action level of 1 mSv per year. Further information is available in the OHS Guideline G7.20(1)-1 Exposure control plan – General requirements to assist employers in determining whether a worker's annual exposure exceeds or may exceed 1 mSv.

To be consistent with section 7.18 of the Regulation, the NOP requirement does not apply to natural background radiation.

G20.3-1 Labour supply firms and construction employers – Responsibilities

Issued February 4, 2010; Revised April 13, 2011; Editorial Revision April 6, 2020

This guideline, dealing with the responsibilities of labour supply firms and their client construction firms toward temporary labour workers, has been expanded to apply generally to all industries. The new guideline is available here: G-P2-21(1)-2 Labour supply firms and client employers – Responsibilities.

G20.3-2 Qualified coordinators

Issued April 27, 2010

Regulatory excerpt
Responsibilities for worker health and safety are established by the *Workers Compensation Act* ("*Act*") and the *OHS Regulation* ("*Regulation*"). Section 20.3 of the *Regulation* states:

> 20.3 Coordination of multiple employer workplaces
>
> (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.

1.1 Definitions

"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;

Purpose of guideline
The purpose of this guideline is to provide information regarding the qualifications of the qualified coordinator under subsection 20.3(2)(a)(i) of the *Regulation*.

Qualified Coordinator
Subsection 20.3(2)(a)(i) requires the owner or prime contractor of multiple employer construction workplaces that have more than five workers to appoint a qualified coordinator. At multiple employer construction workplaces, the role of the qualified coordinator is crucial to maintaining an environment that ensures worker health and safety. The qualified coordinator must ensure that there is communication to employers and workers of hazards present at the workplace, and that those hazards are continuously addressed as they arise.

"Qualified"
The coordinator must be "qualified". "Qualified" is a term defined in the *Regulation* as "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". What specific qualifications are required will depend on the nature of the work and the nature of the hazards created by that work. The qualified coordinator needs to possess experience in and an understanding of the work, including specific work processes and equipment used. Given that in order to fulfill the duties in subsection 20.3(3), the qualified coordinator is required to work with employers and workers at the workplace, the qualified coordinator should also have the ability to provide direction to others and to be able to effectively communicate with the employers and workers present at the workplace.

Ideally the qualified coordinator will possess some formal training or a trade certification that would suggest the person is capable of identifying and addressing hazards. However, a trade certification is not a specific requirement, provided that the qualified coordinator is knowledgeable of and experienced in the work being undertaken at the workplace.

G20.3.2 Washroom facilities required at specified construction sites

Issued consequential to October 1, 2024 Regulatory Amendment; Editorial Revision January 23, 2025

Regulatory excerpt
Section 20.3.1 of the OHS Regulation (*"Regulation"*) states, in part:

…

"*flush toilet*" means a toilet that meets the following specifications:

(a) the toilet is connected to a sanitary sewer system or a holding tank;

(b) the toilet has a trap or positive seal separating the bowl from the sanitary sewer system or holding tank;

(c) waste is flushed from the bowl by means of a flow of clean water or a mixture of clean water and chemicals;

…

Section 20.3.2 of the *Regulation* states:

(1) Subject to subsection (2), the employer must ensure that a sufficient number of flush toilets are readily available for workers at a specified construction site.

(2) If it is not practicable to provide flush toilets, the employer must ensure that a sufficient number of chemical toilets or other types of toilets are readily available for workers at the specified construction site.

(3) The employer must ensure that each toilet available at a specified construction site

(a) is maintained in proper working order,

(b) is cleaned and sanitized as frequently as necessary to keep it in a clean and sanitary condition,

(c) is situated within an enclosed space that

(i) provides privacy for the user,

(ii) is illuminated and ventilated, and

(iii) is heated, if heating the enclosed space is practicable,

(d) includes a handwashing facility within or close to the enclosed space referred to in paragraph (c), and

(e) has the supplies that are necessary for its use.

(4) The employer must ensure that a record is maintained in respect of actions taken for the purpose of complying with subsection (3) (a) and (b).

(5) The period of time covered by a record under subsection (4) must be no shorter than the most recent 30 days.

(6) In the case of a multiple-employer workplace, the duties imposed on the employer under this section also apply to the prime contractor for the workplace.

Purpose of guideline
The purpose of this guideline is to set out factors to consider when determining if it is not practicable to provide flush toilets at specified construction sites as defined by section 20.3.1 of the *Regulation*.

Practicable
Section 1.1 of the *Regulation* states defines "practicable" as "that which is reasonably capable of being done." Whether something is "practicable" is determined by applying an objective test based on what a reasonable person with full knowledge of the situation would decide in the circumstances. This means that an employer should meet the standard of behaviour expected of a reasonable employer in their position who is required to comply with the same regulatory requirements. Factors to consider include what the employer ought reasonably to have known and what was reasonably foreseeable in the circumstances. Determining what is "practicable" depends on the circumstances of each workplace and is a matter of site-specific assessment and judgment.

There are two elements to determining what is "practicable." The employer must first consider what is capable of being done in the circumstances. They then must consider whether it is reasonable in the circumstances to do all that is capable of being done.

The washroom facilities hierarchy
Sections 20.3.2(1) and 20.3.2(2) of the *Regulation* set out a hierarchy with respect to washroom facilities at a specified construction site. Employers must first consider if providing flush toilets is practicable or not. A flush toilet must meet the criteria required in section 20.3.1 of the *Regulation*.

If an employer determines providing flush toilets is not reasonably capable of being done, they should be prepared to explain their rationale and provide any supporting evidence, if necessary. The onus is on the employer to demonstrate it is not practicable to comply with the requirement to provide flush toilets.

Assessing practicability
Planning and budgeting for the provision of flush toilets should be considered at the start of a workplace project. In determining what would be practicable in the circumstances, the employer should consider all relevant factors and strike a balance between what is theoretically possible and what is reasonable in the circumstances. The employer should assess the practicability of installing flush toilets, whether connected to a sanitary sewer system or a holding tank, taking into consideration the nature of the work and workplace along with other site-specific conditions.

Circumstances can change over the course of a construction project and may require a reassessment of what is or is not practicable, including what constitutes a sufficient number of washroom facilities. For example, a specified construction site may start with flush toilets connected to a holding tank and work toward installing flush toilets connected to a sanitary sewer system when a suitable serviced location is available. Many construction projects include flush toilets connected to a sanitary sewer system as part of the finished design, and prioritizing the completion of these areas or other suitable locations should be considered. What was practicable or not practicable at an earlier phase of the construction project may be different at a later phase of the construction project. In some cases, a combination of flush toilets and chemical toilets, or other types of toilets, may be used following the assessment of what is practicable throughout the specified construction site. In most cases it will be practicable to provide flush toilets, given the flexibility under the *Regulation* to connect those toilets to either a sanitary sewer system or a holding tank. Employers and the prime contractor should review the construction project regularly to ensure they meet the requirements of the *Regulation* in terms of what is practicable.

Worker participation
Creating and managing a safe and healthy workplace involves everyone. For workers to be truly engaged in health and safety, they need to know

their employer and supervisor value their well-being and their input. The employer should regularly consult with their joint health and safety committee and affected workers during the course of the construction project in determining the practicability of flush toilets. Consultation with workers and others who are or may be involved in the particular work or workplace is an important means of obtaining relevant information in determining what is reasonably capable of being done.

Shared responsibility
Maintaining clean and sanitary washrooms on worksites is a shared responsibility between employers and workers. While an employerâ€™s role is to ensure compliance with its health and safety obligations related to washroom facilities, workers also play a role in respecting communal spaces and promptly reporting cleanliness issues to their employer. Employers and workers actively meeting their responsibilities fosters a culture of cleanliness and safety that promotes better health, morale, and productivity at the workplace.

Other considerations
Section 20.3.2 of the *Regulation* requires washroom facilities to be "readily available for workers at a specified construction site." Similarly, section 4.85(1) of the *Regulation* requires washroom facilities to be "readily available for workers." OHS Guideline G4.85(1)-2 has interpreted this to mean the walking distance from a working area to a washroom should not be more than 60 metres (200 feet). It also states that in multi-storied workplaces, washrooms should not be more than one floor above or below the working area. Therefore, in order to ensure a sufficient number of washroom facilities are readily available at larger, specified construction sites, flush toilets may need to be supplemented with chemical or other types of toilets.

In addition, section 20.3.2 requires the employer to provide a "sufficient number" of washroom facilities. OHS Guideline G4.85(1)-1 provides guidance under section 4.85(1) of the *Regulation* with respect to determining the sufficient number of washrooms.

As with all washroom facilities, the importance of ongoing maintenance and cleaning must not be overlooked. Washroom facilities will require a routine servicing schedule and must be inspected regularly to ensure they are kept clean and fully functional as required by section 20.3.2(3) of the *Regulation*. OHS Guideline G4.85(3) provides guidance under section 4.85(3) of the *Regulation* with respect to maintenance of washroom facilities.

All workplace parties using the washroom facilities have an obligation to ensure the ongoing cleanliness and functionality of the facility, and workers should report any deficiencies to a supervisor or employer. Sections 20.3.2(4) and (5) require the employer to maintain records regarding the maintenance of washroom facilities and to retain those records for a period no shorter than the most recent 30 days. The employer should maintain these records in a manner that allows them to be provided to a WorkSafeBC prevention officer for review.

Multiple-employer workplaces
At a multiple-employer workplace, the prime contractor is responsible for coordinating health and safety. This responsibility includes determining the practicability and the installation of flush toilets. Employers and the prime contractor must review the construction project regularly to ensure washroom facilities on site meet the requirements of the *Regulation*.

G20.4(1) Suitable ladders, work platforms, and scaffolds

Issued August 13, 2008

Regulatory excerpt
Section 4.61 of the *OHS Regulation* ("*Regulation*") states:

> 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.

Section 13.1 of the *Regulation* states, in part:

> "scaffold" means any temporary elevated work platform and its supporting structure used for supporting workers, materials or equipment;
>
> "work platform" means an elevated or suspended temporary work surface used for supporting workers and includes a scaffold and boatswain's chair.

Section 13.6(1) of the *Regulation* states:

> If work cannot be done from a ladder without hazard to a worker, a work platform must be provided.

Section 13.14(1) of the *Regulation* states:

> 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.

Section 20.4(1) of the *Regulation* states:

> 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.

Purpose of guideline
The purpose of this guideline is to discuss suitable ladders, work platforms, and scaffoldings, and to specify that the top plate of interior or exterior walls, the top plate, or top walers used in concrete formwork, or other elevated surfaces narrower than a nominal width of 50 cm (20 in) are not considered suitable work platforms. Similarly, the guideline specifies that such surfaces are not acceptable elevated walkways. The guideline also discusses when a ladder is considered suitable.

Application
Section 20.4(1) of the *Regulation* requires, where practicable, suitable ladders, work platforms, and scaffolds must be provided to and used by workers when their work activities require positioning at elevations above a floor or grade. This includes heights above and below 3 m (10 ft). Work surfaces at elevations above 3 m, or 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, must also comply with the requirements of section 11.2 of the *Regulation* to use appropriate fall protection.

Suitable ladders, work platforms, and scaffolding
Whether or not a ladder, work platform, or scaffolding will be considered "suitable" will depend on the intended use. For example, a ladder may be considered suitable when the intention is to only use it for short term, light duty work. However, if the nature of the use will require the maneuvering of heavy objects, such as guiding concrete pump hoses, a ladder would not be considered suitable, and a work platform or scaffolding should be selected. In selecting suitable scaffolding or work platforms, employers have a number of options. Specifically, scaffoldings using manufactured scaffolding brackets, when installed and used in accordance with the manufacturer's instructions, are considered suitable. Single-pole wood scaffolds may also be suitable when properly installed and used. For more information on suitable ladders, work platforms, and scaffolding, refer to *Safe Work Practices for House Construction.*

Top plate, top waler, or other surface less than 50 cm (20 in) wide is not a suitable work platform or scaffold
Section 20.4(1) of the *Regulation* requires, where practicable, suitable ladders, work platforms, and scaffolds must be provided to and used by workers when their work activities require positioning at elevations above a floor or grade. If a top plate or other elevated surface is to be used as a temporary work surface, such surfaces must satisfy the requirements for scaffolding and work platforms under Part 13 of the *Regulation*. Under section 13.14(1)(a), the work platform of a scaffolding must be a minimum nominal width of 50 cm (20 in). The top plate of interior or exterior walls, the top plate or top waler of concrete formwork, the tops of floor or roof joists, the bottom cord of ceiling trusses, or other elevated surfaces narrower than a nominal width of 50 cm (20 in) do not meet this condition. Accordingly, failing to provide or use suitable alternatives to such surfaces where practicable is a violation of section 20.4 of the *Regulation*.

Elevated walkways
An elevated walkway includes any surface above a floor or grade used by workers or other persons at the workplace to move between two or more areas. Under section 4.61 of the *Regulation*, an elevated walkway must be at least 50 cm (20 in) wide. This includes top plates used to move from one section of a wall to another, or top walers or tops of concrete formwork used to move from one section of the formwork to another. For a worker to use any such surfaces as an elevated walkway, the surface must be at least 50 cm (20 in) wide. Providing and/or using the top plate of interior or exterior walls, the top plate or top waler of concrete formwork, the tops of floor or roof joists, the bottom cord of ceiling trusses, or other surface narrower than 50 cm (20 in) as an elevated walkway is a violation of section 4.61 of the *Regulation*.

Use of ladders only when there is no hazard to the worker
Under section 20.4 of the *Regulation*, a worker who requires positioning at an elevation above a floor or grade may be provided with and use a ladder when the ladder is considered 'suitable' and the requirements of Part 13 of the *Regulation* are met. Under section 13.6(1), if work cannot be done from a ladder without hazard to the worker, a work platform must be provided. To avoid exposing a worker to a hazard, work from a ladder should be limited to light duty work where the ladder will be at any one spot for sporadic, short-term work. This may include marking out where floor joists or trusses will be, or other activities where the worker can reasonably maintain three points of contact with the ladder. Work such as aligning floor joists or trusses, guiding concrete pump hoses, or other activities that require the worker to maneuver heavy objects, is not acceptable. These activities are considered to expose the worker to a hazard if conducted from a ladder. A failure to provide or use a work platform where work from a ladder exposes the worker to a hazard is a violation of section 13.6(1) of the *Regulation*.

G20.4(2) Suitable access for safe delivery of equipment and materials

Issued January 1, 2007; Editorial Revision April 6, 2020

Regulatory excerpt
Section 20.4(2) of the *OHS Regulation* ("*Regulation*") states:

> There must be suitable access for the safe delivery of equipment and materials to locations in the workplace where they will be used.

Purpose of guideline
This guideline provides examples of "equipment and materials" under section 20.4(2) of the *Regulation*, discusses coordination among workplace parties, and provides examples of safe delivery, interior access, and material handling practices.

"Equipment and materials" under section 20.4(2)
Examples of equipment and materials delivered to building construction sites include but are not limited to drywall, appliances, cabinets, concrete, powered concrete finishing equipment, and trusses. Examples of equipment and materials delivered to road and municipal services construction sites include but are not limited to pipes, hydrants, valves, manhole sections, and portable powered compactors.

Coordination
Prime contractors, owners, employers, supervisors, sub-contractors, and delivery companies all have responsibilities, and must work together to plan and ensure that suitable access is maintained for safe delivery to locations where equipment and materials will be used. See general duty sections under the OHS provisions of the *Workers Compensation Act*.

Recommended planning activities include the following:

- Developing company and site policy and safe work practices for delivering materials and equipment
- Pre-planning the project to provide sufficient clear access points to the site to allow for the safe delivery of equipment and materials
- Coordinating delivery times with delivery companies

Safe delivery practices
The following practices, where applicable, can help ensure that materials and equipment are delivered safely:

- Clear ground access for telescoping boom forklifts or boom trucks, ensuring the area is
  - free of overhead hazards, such as power lines
  - graded and stabilized to provide a solid compacted soil surface or properly shored concrete slab.
- Maintain access routes to allow equipment to safely maneuver.
- Allow for several locations where materials can be delivered to a floor area.
- Make available access openings large enough to safely accommodate passing materials from the boom truck/forklift into the structure.
- Minimize manual handling by using boom trucks, lift trucks, or similar material handling equipment to deliver materials and equipment as close as possible to the location where they will be used. Provide sufficient clear access for the material handling equipment.
- Eliminate, where practicable, situations where workers manually handle large or heavy items on stairs.
  Note: Section 4.50 of the *Regulation* specifies the controls that are required to eliminate, if practicable, or minimize the risk of musculoskeletal injuries.
- Provide guardrail protection and/or anchor points on the structure at wall openings and balconies to enable workers to use appropriate fall protection when transferring materials from the boom truck/forklift into the structure (see also the requirements for fall protection under Part 11 of the *Regulation* and guardrails under sections 4.58 and 4.58.1).
- Install one or more windows temporarily on the inside of the wall to allow easy removal of the window. If windows are not large enough or accessible for the delivery of materials create a temporary access hatch at suitable locations in walls.

Safe interior access practices
Examples of safe interior access practices include the following:

- Distribute materials so that the floor in any area is not loaded beyond the permissible floor loadings
- Where appropriate, ensure there is sufficient access through framed walls inside the building; for example, ensure that plumbing and electrical wiring runs do not impede workers from carrying materials, such as wallboard, between wall studs to adjacent rooms
- Use guardrails to accommodate the safe movement of materials on stairways (see also the requirements for guards and guardrails under sections 4.58 and 4.58.1)
- Install stairs leading down to the basement before the delivery of materials to the basement, or if there is no access to the basement, designate areas on the floor where materials can be lowered
- Clear hallways and stairs of debris and equipment that may cause slipping and tripping hazards

Appropriate material handling equipment
Ensure material handling equipment, such as boom trucks, rough terrain cranes, forklifts, and telescoping boom lifts, are suitable for use on the site terrain and have sufficient reach and capacity to handle the equipment and materials to the location where workers can safely handle materials and equipment manually.

Note: Section 4.3 of the *Regulation* provides that the employer must ensure that each piece of equipment in the workplace is capable of safely performing the functions for which it is used, and is selected, used, and operated in accordance with the manufacturer's instructions, safe work practices, and the requirements of the *Regulation*.

G20.5(5) Responsibilities for employers to provide stairways to work levels during construction

Issued March 7, 2011

Regulatory excerpt
Section 20.5(5) of the *OHS Regulation* ("*Regulation*") states:

> 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.

Purpose of guideline
Section 20.5(5) of the *Regulation* requires that a stairway must be provided to each floor level "before construction of the next floor or deck surface is undertaken." The purpose of this guideline is to specify when stairways must be installed during construction.

Next floor or deck surface
The purpose of the erection of a stairway during the building process is to provide a safe, easy method of access from one floor to the next during the construction process. A stairway must be in place as soon as practicable once the basic structure of the next level is in place, and before construction of the floor or deck surface on that next level begins. If work begins on the next floor or deck surface and no stairway to that level is in place, it will constitute a violation of section 20.5(5) of the *Regulation*.

For example, the construction of the first level of a new residential building has been completed. The joist and beam structure for the second level may be completed. As soon as possible and before beginning work on the floor or deck surface on the second level, a stairway must be erected from the first level to the second. The stairway may be temporary (consisting of at least framing, safe treads, and a handrail) or permanent. Stairs open on both sides (not against a wall or other structure) must have handrails compliant with section 4.62 of the *Regulation* on both sides.

G20.9 Protection from falling materials

Issued August 1999; Editorial Revision June 14, 2013

Regulatory excerpt
Section 20.9(3) of the *OHS Regulation* ("*Regulation*") states:

> 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).

Purpose of guideline
This guideline explains where more information may be found on the design of protective canopies and explains application of the regulatory requirement.

Protective canopies
Protective canopies are usually of wood frame design. Part 9 of the *BC Building Code* includes design tables for roof rafters and roof joists that are rated for 2.5 kPa. Minimum thickness for subflooring and roof sheathing are also specified. A qualified framer should be familiar with the Part 9 requirements and be able to interpret the tables correctly. Appendix A in the *BC Building Code* allows for the tabulated values to be extrapolated. For example, in applications where a design loading of 5.0 kPa is more appropriate than 2.5 kPa, the spacing between rafters can be halved to achieve the rating.

A free-spanning canopy may not be required to achieve adequate protection. For example, since the roof of a typical mobile office trailer has probably not been designed for 2.4 kPa, additional protection could be achieved by laying sheets of plywood on the roof. Whether plywood alone is sufficient depends on the evaluated hazard. The impact of an object falling onto the plywood represents a dynamic load, and varies in magnitude with the falling object's mass and the fall distance. Other factors in this example include the stiffness of the falling object and of the plywood.

A heavy hard object falling from a great height onto a rigid surface will impose a high impact load. The minimum design value of 2.4 kPa may be inadequate if this is the potential exposure. Effective implementation will require the application of good judgment to properly identify the hazards.

G20.13(3.1) Ensuring loads do not exceed capacity of thrust-out platforms

Issued June 14, 2004; Revised May 17, 2006; Editorial Revision April 6, 2020

Regulatory excerpt
Section 20.13 of the *OHS Regulation* states:

> (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 (BC Reg. 420/2004).

Purpose of guideline

This guideline describes the measures WorkSafeBC considers acceptable under section 20.13(3.1), to ensure all loads placed on a thrust-out crane landing platform are safely supported and can be safely attached to and detached from the rigging. If a person wishes to use a control system not described in this guideline, an application would need to be made to WorkSafeBC, and the acceptability of that system affirmed in writing by WorkSafeBC before such a system is implemented.

To ensure safe operations on the platform, consideration must be given to more than individual loads placed on the platform by the crane. Other considerations include loads manually placed on the platform, multiple loads, load distribution and stability, as well as safe access for workers connecting and detaching the rigging from the load. The control measures outlined in this guideline involve work procedures or work procedures combined with engineering controls.

A system of nine control measures acceptable to WorkSafeBC is outlined below. The effective implementation of the system requires the fulfillment of the responsibilities by the prime contractor and the employer. The guideline provides three options for determining the weights of loads, and discusses two types of engineering controls that may be used as part of the system to ensure that platforms are not overloaded.

Responsibilities of the prime contractor and employers

The prime contractor, consistent with their responsibilities under section 24 of the *Workers Compensation Act* ("*Act*"), is responsible for ensuring that a control system, including appropriate supervision, is in place to prevent thrust-out platforms from being overloaded. That responsibility involves doing everything that is reasonably practicable to establish and maintain the system to ensure worker safety, and to ensure that the activities of employers, workers and other persons at the workplace are coordinated. It is reasonably practicable for the prime contractor to ensure that a control system for thrust-out platforms as described in this guideline is established and maintained.

The employer who arranges for the thrust-out platform to be brought on-site and used must also ensure the safe use of the platform, consistent with their responsibilities under section 21(1) of the *Act* to protect their workers and any other workers present at the workplace where that employer's work is being carried out. This is typically the formwork contractor.

If another employer wishes to use the thrust-out platform, or if the formwork contractor leaves the site, the ongoing responsibilities of the prime contractor are the key to worker safety, both to ensure the activities of new employers are properly coordinated and that the necessary steps are taken to ensure the safe use of the platform.

Control system

The system for controlling the risks when using thrust-out crane landing platforms includes assigning responsibilities to affected workers, ensuring the rated capacities of platforms are marked and known, ensuring the weights of all loads to be placed on the platform are known, ensuring the platform size is compatible with the loads to be placed on the platform, and a system of supervision is in place. The control system will include the following:

1. **Responsibilities of crane operator:** The crane operator has responsibilities that include ensuring that the weight of any load to be landed on the thrust-out platform does not exceed the platform capacity.
2. **Responsibilities of riggers:** Riggers are responsible for determining weights of loads to be lifted and communicating the weights to the crane operator, as provided under options A, B or C below. Riggers are to be designated by a responsible authority on-site, and should be qualified to perform their duties by reason of training, education, experience or a combination. Riggers are responsible for ensuring only loads that can be safely attached or detached from the rigging are placed on the platform.
3. **Ensuring rated capacities of platforms are known:** Each thrust-out landing platform must be clearly marked with its rated capacity in accordance with section 20.13(3) of the *OHS Regulation*. The rated capacities of the thrust-out landing platforms are to be made known to the crane operator, to the rigger, and to any other affected person, such as the worker who is monitoring the accumulated loads on thrust-out platforms. An effective means should be in place to ensure these persons can access the information on the rated capacity without delay.
4. **Ensuring an effective means for determining the weights of loads to be lifted by a crane:** There are three acceptable options in this guideline for determining the weights of loads: A) an administrative option in which a list of expected weights of loads is used, B) a load cell on the crane, and C) use of a load weighing device on-site. These options are explained in more detail at the end of this list of control measures.
5. **Ensuring an effective means for determining the weights of loads to be placed manually on the platform:** The weights of materials or equipment manually placed on the platform will be determined before they are placed. The weights may be determined by calculation, by reference to appropriate documents, or by weighing the load.
6. **Monitoring the total load placed on the platform:** A person will be responsible to ensure cumulative loads placed on the platform do not exceed the rated capacity and that the loads are evenly distributed.
7. **Ensuring there is adequate space on the platform:** The platform area must be sufficient to allow all loads to be placed such that they will be stable. Generally this will require the loads to fit within the periphery of the platform. Riggers must have sufficient room to access rigging points on the load.
8. **Ensuring an effective system of supervision in place:** Supervision is to be provided to ensure the required work procedures are followed.
9. **Ensuring the procedures are made known to all affected workers:** This can be done by posting the written procedures on a bulletin board and advising affected workers of them, or by other effective means. Posted procedures need to be kept in legible condition.

Options for determining the weights of loads under element #4 of the control system

A. Administrative option: For this option to be acceptable to WorkSafeBC all the following measures will be in place:

- A list of the weights of items to be placed on the platform will be available.
- The list will include all the equipment, materials, and other items expected to be placed and will provide the weights for each.
- If a garbage box is to be used, the all-up weight of the garbage box will be included in the list. The all-up weight for a garbage box is its dead weight (that is, weight when empty) combined with its rated capacity. For example, if the dead weight of a garbage box is 600 lbs. and the garbage box is rated for 4,000 lbs, the list must show the all-up weight for the box, which is 4,600 lbs;
- The list is to be provided to the crane operator, to the rigger, and to any other necessary person, and posted at each platform.
- The rigger is responsible for ensuring the bundled loads are in accordance with the supplied list (number of pieces, size, length, etc.). In the case of loads manually placed on the platform, the person placing the load on the platform is responsible for ensuring bundled loads are in accordance with the supplied list.
- If an item to be lifted is not on the list, the weight must be determined before it is placed on the platform. In the case of lifted loads, the rigger is responsible to determine the weight of the item and to communicate the weight to the crane operator. If there are repeat lifts of such an item, the list will be updated to include it. If the rigger does not know the weight of a load or cannot with substantial certainty estimate it, then the load is not to be lifted.

B. Load cell on the crane: Under this option, the employer responsible for the crane is to ensure there is an electronic load cell that registers the weight of each load being lifted and displays it to the operator at the controls. Administratively, this is the least complex system, as the crane operator will know the weights directly. There is no need for the rigger to advise the operator of weight information, except when an operator requests an advance estimate before the lift.

C. Load weighing device on-site: This option involves the use of a weighing device separate from the crane. The device is to be used whenever the rigger and crane operator do not have advance information on the weight of a load to be lifted. If the weight displayed by the device cannot be directly observed by the crane operator, it is the responsibility of the rigger to ensure that the weight is communicated to the crane operator.

Engineering controls for limiting the load placed on a platform by a crane
Either of the following two engineering controls may be used to help ensure that a single load placed by a crane does not exceed the rated capacity of a thrust-out platform:

- Use of a crane for which the rated capacity at the radius for placing loads on the thrust-out platform does not exceed the rated capacity of the platform.
- Adjustment of overload limit switches to effectively reduce the lifting capability of the crane so that it does not exceed the rated capacity of the thrust-out platform.

If such controls are used, the overall control system must still ensure that the platform is not overloaded in circumstances such as multiple loads placed by a crane on the platform, and manual placement of loads on it. In addition, the platform must have adequate space for loads.

G20.14 Temporary cribbing support in house lifting operations

Issued December 16, 2016; Editorial Revision April 6, 2020

Regulatory excerpt
Section 20.14 of the *OHS Regulation* ("*Regulation*") states:

> ***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.

Section 4.34 of the *Regulation* states:

> ***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.

Purpose of guideline
The purpose of this guideline is to provide information and best practices about providing temporary supports to structures during house lifting operations.

House lift design and planning
Lifting a house is a complex task that requires proper planning and a high level of expertise. Section 20.14 of the *Regulation* provides that 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. In order to ensure that the temporary cribbing support system is capable of withstanding the loads, pre-planning for a house lifting operation should generally include a design drawing prepared by a professional engineer registered in B.C. The design drawing may be site-specific or standardized.

House lift drawing requirements
In order to demonstrate that the temporary cribbing supports can withstand any loads likely to be imposed on them, a house lift drawing (whether site-specific or standardized) should typically include the following information:

1. The intended purpose, authorized users, and application for the drawing.
2. The requirements and restrictions for those using the drawing (such as specific material or site conditions, design wind loading, specific aspects requiring higher level oversight or connection requirements).
3. Assumptions made, referenced codes and, where applicable, the factors of safety used in producing the drawing.
4. Limitations on the application of the drawing.
5. The maximum length of time that the house can be safely supported by temporary cribbing supports before the professional engineer responsible for the house lift drawing must be contacted.
6. Requirements, procedures, and frequency of inspection for the temporary cribbing supports while the house is supported.
7. Critical conditions and scenarios where the design engineer must be contacted immediately.
8. The material grades and specifications of all support beams, cribbing, and temporary bracings.
9. The type of bearing (soil, concrete, etc.), allowable bearing pressure, and site preparations required to adequately support the temporary cribbing supports and lifting/lowering operations.
10. Shimming requirements.
11. The name, signature and seal of the professional engineer responsible for the drawing.
12. The perimeter of the base of the house after it is raised to the temporary support level.
13. The location and direction of the existing horizontal framing elements, joists and beams that are to be supported at the temporary support level.
14. The location of the existing bearing walls and post/beams above the temporary support level.
15. The location, direction and size of temporary support beams.
16. The location, size and height of temporary support cribs (including dimensions between crib centerlines and from the building perimeter to crib centerlines) and maximum loading on the support cribs.
17. The size, orientation, and arrangement of individual timbers in the temporary support cribs.
18. The site address.
19. A north arrow to identify the orientation of the house.

Standardized house lift drawings
A standardized house lift drawing is designed to accommodate multiple job sites that meet certain predetermined design parameters and limitations. It allows the user to extract the engineering information required for a house lift drawing based on the specific conditions of the job site. A standardized house lift drawing will generally include member selection tables, schematic diagrams, design limitations and engineering specifications. It will also include the date the drawing was signed and the date after which the drawing is no longer valid or applicable.

When a standardized house lift drawing is used, the user should identify and document all site-specific details, such as the existing house plan and framing details, and the locations of the temporary support elements (items 12 to 19 listed above). Standardized house lift drawings are intended to be used by individuals who are knowledgeable and competent, and have adequate training and experience in house lifting.

When a standardized design drawing is used, the employer conducting the house lifting operation will normally:

1. Obtain documented authorization from the professional engineer responsible for the standardized house lift drawing that the drawing may be used by the employer. This may include, for example: a written agreement, an email, or a notation on the drawing stating the authorized employer's name.
2. Discuss the standardized house lift drawing with the professional engineer responsible to ensure that the limitations of the drawing are understood by the employer.
3. Seek assistance from a professional engineer when the applicability of a standardized house lift drawing is in question or unforeseen circumstances make the drawing not applicable.

Special considerations
There are cases where, in order to ensure that all partially assembled houses or components are supported as necessary to safely withstand any loads likely to be imposed on them (section 20.14), the employer may need to engage a professional engineer to provide site-specific direction and design on support beams, cribbing, other temporary support members, lifting and lowering procedures, or other measures. Some cases where site-specific engineering direction is typically needed include, but are not limited to, the following:

1. The house is not comprised of typical wood platform frame construction.
2. The house utilizes post-and-beam or balloon frame construction.
3. The house's wall sheathing, interior wall finishing, floor sheathing, or roof sheathing is either in poor condition or not intact.
4. The house contains additions or unconventional structural elements which produce unorthodox framing or unusual load paths.
5. The house is structurally unfinished or damaged.
6. The integrity of the house and any adjoining structures could be compromised by house lifting or lowering operations.
7. The house contains masonry chimneys, masonry cladding or other non-structural elements which require temporary support or bracing prior to house lifting operation.

Employer responsibilities
All employers involved in the house lifting operation have responsibilities to ensure worker safety at various stages of the project. Some of those responsibilities include:

<u>Prior to the house lifting operation</u>

1. Ensuring all hazards associated with utility connections to the house (water, sewer, gas, electrical, etc.) have been assessed and controlled prior to the lifting operation.

During house lifting and lowering operations

1. Ensuring site supervision responsibilities are clearly identified and assigned to a competent site supervisor, who will be on site to perform supervisory responsibilities during house lifting and lowering operations.
2. Ensuring adequate supervision is provided during site layout, installation of support beams and cribs, and house lifting and lowering operations.
3. Ensuring the house does not contain any unconventional structural additions, unorthodox framings, or unexpected load paths; if any such conditions exist, the employer will seek assistance from a professional engineer.
4. Ensuring no persons occupy the house at any time during house lifting and lowering operations.
5. Prohibiting access and securing the house in accordance with section 4.34, so it is inaccessible to workers at any time during house lifting and lowering operations.
6. Ensuring support beams and cribs are properly selected based on the house lift drawing.
7. Ensuring support beams and cribs are arranged to properly support the building and all floor joist spans in accordance with the house lift drawing.
8. Ensuring proper bracing for non-structural parts of the house, when required, is provided in accordance with the house lift drawing or the professional engineer's specification.
9. Ensuring all temporary support elements are made of properly graded materials in accordance with the house lift drawing.
10. Ensuring all crib timbers, timber support beams, and any other temporary timber support elements are in good condition and free of splits, decay, or any type of physical damage which could reduce the strength of the timber.
11. Ensuring all jacking timbers are of full dimension and free of splits, checks, notches, or knots directly below the jacking point.
12. Ensuring all steel support beams are in good condition and free of any physical damage, fatigue damage, fabrication defect, deformation, or corrosion with noticeable section loss which could reduce the strength of the beam.
13. Ensuring all support beams, jacks, jacking timbers, and cribs are maintained plumb at a maximum half-inch in 4 feet and level to a maximum half-inch in 4 feet at any time during house lifting and lowering operations.
14. Ensuring an adequate contact area at the contact points between all crib timbers on every layer of cribbing; wedges and shims as prescribed on the house lift drawing may be installed to obtain the required contact area.
15. Ensuring support beams are placed on temporary cribbing supports as specified on the house lift drawing.
16. Ensuring an adequate number of load sharing blocks are provided at jacking blocks and the bearing points under support beams in accordance with the house lift drawing.
17. Ensuring an adequate number of crib timbers are provided at the bottom layer of cribs to achieve sufficient bearing on the supporting soil in accordance with the house lift drawing.
18. Ensuring any existing concrete slabs or pads, if present, that will be used to support cribs are adequate for this purpose.
19. Ensuring no other work is conducted during the jacking operation.
20. Ensuring the stability of the foundation walls is not jeopardized and adequate temporary supports to the walls are provided as needed.
21. Conducting and documenting visual inspections to identify any shifting of supports or movement of the house during house lifting and lowering operations.

While a house is supported on temporary cribbing supports

1. Ensuring site supervision responsibilities are clearly identified and assigned to a competent site supervisor, who will be on site to perform supervisory responsibilities while the house is supported on temporary cribbing supports.
2. Prohibiting access and securing the house in accordance with section 4.34, so it is inaccessible to workers at any time the house is supported by any kind of temporary supports.
3. Ensuring the house is not left on temporary cribbing supports longer than the maximum time specified on the house lift drawings. The employer will consult with the professional engineer responsible for the house lift drawing if the house must remain on temporary cribbing supports beyond the maximum duration specified on the house lift drawing.
4. Ensuring regular visual inspections are conducted and documented to identify any shifting of supports or movement of the house (at a minimum, the frequency of inspections must meet the interval specified on the house lift drawing).
5. Ensuring all support beams and cribs are maintained plumb at a maximum half-inch in 4 feet and level to a maximum half-inch in 4 feet at any time the house is supported by any kind of temporary supports.
6. Ensuring all cribs and support beams remain undisturbed, are not exposed to any unintended loads, and are not used for any purpose other than supporting the house.
7. Ensuring no water collects in or around the base of the cribs.
8. Ensuring there is no settlement of the ground supporting the cribs.
9. Ensuring there is no excavation below the crib base level unless authorized by a professional engineer.

Other applicable regulations

In addition to section 20.14, all other applicable sections of the *Regulation* and the *Workers Compensation Act* must be complied with during a house lifting and lowering operation involving temporary cribbing supports. This includes, but is not limited to, the following sections:

1. Section 4.2 of the *Regulation* states that 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.
2. Section 20.2(1) of the *Regulation* requires that, in certain circumstances, a notice of project (NOP) be filed at least 24 hours before starting

a construction project. This includes when the total cost of labour and materials for the work exceeds $100,000, or when 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.
3. Section 20.79 of the *Regulation* provides that 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.
4. Sections 20.111-20.121 of the *Regulation* apply when a structure is to be demolished in whole or in part (the term "demolition" is defined in Section 20.1).
5. Sections 21-30 of the *Act* set out the general duties of employers, workers and other workplace parties.

G20.26 Inspections

Issued August 1999; Editorial Revision April 9, 2008; Revised consequential to December 1, 2013 Policy Deletion; Revised consequential to February 1, 2015 Regulatory Amendment; Revised consequential to June 3, 2019 Regulatory Amendment

Regulatory excerpt
Section 20.26 of the *OHS Regulation* ("*Regulation*") states, in part:

> (1) Subject to subsection (4), immediately before placement of concrete or other intended loading of specified formwork and any associated falsework or reshoring, the employer must ensure that
>
> (a) the formwork, falsework and reshoring are inspected by a professional engineer, and
>
> (b) the professional engineer issues a certificate that
>
> (i) indicates the specific areas inspected, and
>
> (ii) certifies that the formwork, falsework and reshoring have been erected in accordance with up-to-date worksite-specific plans.
>
> (2) The certificate required by subsection (1) (b) must be available at the worksite for inspection by an officer.
>
> (3) If ganged forms are being reused on the same worksite with any modification to the design or method of erection of the ganged forms, subsection (1) applies in relation to the reuse of the ganged forms.

Purpose of guideline
This guideline discusses the following:

- Meaning of "other intended loading" and "immediately before"
- Engineering certification when reusing a gang form
- Acceptable means of conducting inspections and issuing a certificate

Meaning of "other intended loading" — section 20.26(1)
When considering this issue, there is a need to keep a broad perspective on the application of sections 20.17 to 20.26 of the *Regulation*. The broad perspective is that falsework is often used to support loads temporarily during construction which are completely unrelated to any concrete formwork. These sections of the *Regulation* refer to concrete formwork and falsework.

Falsework is often used during the erection of steel structures and bridges to temporarily support members until such time as the structural elements can be connected together and braced to be self-supporting and provide a complete structural system. Falsework may also be required and used during the dismantling or demolition of a structure.

Section 20.26(1) of the *Regulation* is not intended to cover the use of falsework during the erection or demolition phases of structures. The reason for this is that sections 20.17 to 20.26 of the *Regulation* only apply to specified formwork and any associated falsework or reshoring that are used to install cast-in-place concrete (as noted in section 20.16.2 of the *Regulation*).

The employer has responsibility under sections 4.2, 20.6(2), 20.14, 20.15, and 20.23 (2), (3), and (4) of the *Regulation* to ensure that any structures or equipment which are being erected, used or dismantled are properly managed to ensure the stability of the structure and that no overloading of any elements takes place. It is under these sections of the *Regulation* that loads such as bundles of reinforcing steel or sheeting material have to be managed. Such loads are not intended to be within the scope of "or other intended loading," in section 20.26(1). Hence no inspection and engineering certification under section 20.26(1) should be required prior to their placement.

Meaning of "immediately before"
The phrase "immediately before" generally means the inspection be done not more than 24 hours prior to the start of concrete placing, and after construction of the formwork for the particular concrete pour has been substantially completed. Inclement weather subsequent to the inspection, or other causes for delay of the concrete placing, will normally necessitate an additional inspection and a professional engineer to revalidate the inspection certificate.

Reuse of gang forms after modifications - section 20.26(3)
Section 20.26(3) of the *Regulation* requires that an inspection be conducted and a certificate issued by a professional engineer if ganged forms are

being reused and there has been any modification to the ganged forms or method of erection.

The ganged forms include not only the form (mould) but also the braces and other supporting elements, ties, and associated hardware. Note that section 20.20(1)(b)(vii)states that worksite-specific plans must include details of supports, including dimensions and locations of external braces, ties, and other supporting devices.

For the purposes of section 20.26(3), modifications to the gang form design include, but are not limited to, any change to the following:

- Ganged forms' dimensions
- Number of ties
- Tie spacing
- Bracing of the ganged forms
- Connection details

Modifications to the method of erection include, but are not limited to, any change to the following:

- The support elements
- Design of the pick points
- The attachment of work platforms

Inspections and certificates
The professional engineer who signs, seals, and issues the written certificate prior to each concrete placing, or application of other intended loading, need not personally inspect the formwork. An inspection must be completed by a professional engineer or a directly supervised subordinate and an engineering certificate issued immediately prior to placement of concrete or other intended load. With respect to this certification, direct supervision of the subordinate means taking responsibility for the control and conduct of the engineering work.

G20.26.6 Operator certification

Issued consequential to the December 1, 2021 Regulatory Amendment and the certification requirements that came into effect on January 1, 2024; Editorial Revision June 18, 2024; Editorial Revision November 1, 2024

Regulatory excerpt
Section 20.26.6 of the *OHS Regulation* ("*Regulation*") states, in part:

> (1) In this section, "certification authority" means an organization designated as the certification authority under section 20.26.5(1).
>
> (2) On and after January 1, 2024, a person must not operate a concrete pump or placing boom at a workplace unless the person
>
> (a) holds a valid concrete pump operator's certificate, issued by the certification authority, for the class or type of concrete pump or placing boom being operated and operates the concrete pump or placing boom in accordance with any conditions set out on the certificate, or
>
> (b) operates the concrete pump or placing boom
>
> (i) under the supervision of a person who holds a valid concrete pump operator's certificate for the class or type of concrete pump or placing boom being operated, and
>
> (ii) in accordance with the directions of the certificate holder.
>
> (3) The employer must ensure that a person who operates a concrete pump or placing boom at a workplace complies with subsection (2).

Purpose of guideline
This guideline identifies the "certification authority" pursuant to section 20.26.6 of the Regulation and the enforcement action of WorkSafeBC prevention officers for operators who fail to possess a valid a concrete pump operatorâ€™s certificate.

Certification authority
The BC Construction Safety Alliance (BCCSA) is the only organization designated as the certification authority under section 20.26.5(1) of the *Regulation*. Pursuant to section 20.26.6(2) of the *Regulation*, BCCSA's Certified Concrete Pump Operator program offers the following five specialized certifications:

- Truck Mounted Boom Pumps (over 41 m)
- Truck Mounted Boom Pumps (41 m & under)
- High-Pressure Line Pumps (>1,233 psi)
- Low-Pressure Line Pumps (1,233 psi & under)
- Tower Placing Booms

Enforcement
On inspection, prevention officers will inquire with operators to determine if they possess a concrete pump operator's certificate issued by

BCCSA.

Operators who fail to possess a valid concrete pump operatorâ€™s certificate for the class or type of concrete pump or placing boom being operated will be directed to the BCCSA for immediate registration in the certification program. The prevention officer will also advise the operatorâ€™s employer of the requirement that the operator be certified by BCCSA. The employer and worker may also be subject to orders from WorkSafeBC.

Refer to the BCCSA's Certified Concrete Pump Operator webpage for further details of the certification program.

G20.40 Use of outriggers on concrete pumping equipment

Issued August 1999; Editorial Revisions August 2004 and January 1, 2007; Revised August 31, 2007; Revised consequential to February 1, 2012 Regulatory Amendment; Editorial Revision April 6, 2020

Regulatory excerpt
Section 20.40(1) of the *OHS Regulation* ("*Regulation*") states:

> Outriggers must be used in accordance with the concrete placing boom manufacturer's specifications.

Section 4.3(1) of the *Regulation* states:

> (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.

Section 20.26.3 of the *Regulation* states:

> (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.

Purpose of guideline
The purpose of this guideline is to set out some guiding principles for determining the safe work practices to be followed for deploying outriggers under sections 20.40(1), 4.3(1)(b)(ii), and 20.26.3 of the *Regulation*.

Introduction and background
Outriggers must be fully deployed and the machine leveled in accordance with the manufacturer's instructions. This guideline does not address a situation where the operator wishes to deploy outriggers in a manner contrary to the manufacturer's instructions. In that case, the concrete placing firm can contact the manufacturer to ask for a written confirmation of an altered procedure acceptable to the manufacturer. If that is not feasible, for example because the manufacturer is no longer in business, the firm could apply to WorkSafeBC for a variance. If shortrigging is specifically prohibited by the manufacturer, the procedures described later in this guideline that are provided by a qualified person as an alternate cannot be employed unless there is an approved variance.

Regulation section 20.26.3 requires that a concrete pump or placing boom be operated in accordance with prescribed clauses of *CSA Z151-09, Concrete pumps and placing booms ("Standard")*. Clause 6.3.2 of the *Standard* states that shortrigging may be used only if

> (a) it has been determined that shortrigging is unavoidable
>
> (b) the boom is not operated beyond the area of fully extended outriggers (refer to Figure 10) unless the boom/outrigger control system is range limiting
>
> (c) any outriggers still retracted are jacked and the unit is leveled in accordance with the manufacturer's recommended procedures
>
> (d) the manufacturer's or qualified person's documented procedures are followed

Note: Shortrigging is a condition in which one or more outriggers are not fully deployed on the side away from the boom operational area.

Guiding principles when shortrigging is necessary
Clause 6.3.2(a) of the *Standard* requires that shortrigging only be used if it is impracticable to fully deploy all outriggers. For example,

- The outriggers would put the machine within an unsafe distance to hazards such as excavations and power lines
- The outriggers would extend into traffic and the circumstances of the job render it impracticable to get permission to close traffic lanes (closing traffic lanes is generally subject to municipal approval)
- An adjacent structure or an excavated or natural bank restricts deployment

It is not considered impracticable to fully deploy all outriggers if the purpose is just to

- Increase convenience or save money
- Avoid repositioning the pump
- Avoid moving stored materials that might reasonably be moved

If the manufacturer's instructions are not available, or do not address the means of deployment where full deployment is not practicable, the following are guiding principles for determining the "safe work practices" under section 4.3(1)(b)(ii) of the *Regulation*:

1. As far as possible, the worksite should be organized so that concrete pumping equipment can be used with all outriggers fully deployed when the boom is raised. Section 24 of the *Workers Compensation Act* establishes certain responsibilities on prime contractors at construction projects for complying with the *Regulation*.

Where this section applies, the prime contractor and the employer of the concrete pump operator share responsibility for selecting the appropriate pump to do the job and for planning the pump's location. If a smaller pump can do the job set-up with all outriggers fully deployed, then it should be used instead of a larger pump that cannot be set up with all outriggers fully deployed. Pump location and set-up should be addressed if a pre-job meeting is held.

2. The pump operator should be trained to recognize the circumstances that justify not fully deploying the outriggers.

Clause 6.3.2(d) of the *Standard* requires that any required shortrigging follow the manufacturer's or a qualified person's (defined in the *Standard*) documented procedures.

Written instructions that address the following factors must be available to the operator:

- **Safe operating range**: This refers to the regions where the boom may be positioned to maintain truck stability. Typically the safe operating range is the area bounded by the lines extending from the centre of rotation of the boom through the centerline of the jacks of the fully deployed outriggers. The boom must never be unfolded or extended outside of the safe operating range.
- **Outrigger deployment on the pumping side**: Typically outriggers must be fully deployed on the side of the equipment over which the boom is extended.
- **Outrigger deployment on the side opposite to the pumping side**: Typically, when it is not practicable to fully deploy all outriggers, the outriggers opposite to the pumping side outriggers must be fully retracted and all jacks lowered to the ground to level the equipment. Structural damage or failure may occur to partially extended telescopic outriggers with the jacks lowered.
- **Outrigger bearing load**: Proper cribbing to distribute the load may be needed if the soil conditions require it.
- **Procedure for unfolding the boom**: Typically the boom will be raised from the cradle, rotated to a position within the safe operating range and then unfolded. If the boom cannot be unfolded within the safe operating range, the other outriggers may have to be fully deployed while the boom is unfolded or folded.
- **Precautions for over-centre booms (i.e., moving the centre of gravity toward the side that does not have fully extended outriggers)**: There is the potential for backward instability with over-centre booms.

Note: The American Concrete Pumping Association Safety Bulletin "*Setting outriggers to prevent accidents - Shortrigging*" provides useful guidance in preparing instructions that are specific to the site and equipment conditions. The Bulletin is intended to supplement but not replace the manufacturer's applicable instructions.

G20.47(1) Inspection and certification of masts

Issued April 4, 2007; Revised consequential to February 1, 2012 Regulatory Amendment; Editorial Revision consequential to August 22, 2022 Regulatory Amendment

Regulatory excerpt
Section 20.47(1) of the *OHS Regulation* ("*Regulation*") states:

> 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.

Purpose of guideline
The purpose of this guideline is to outline some of the factors that should be considered when determining if an inspection has been conducted in accordance with "good engineering practice" under this section. It also provides information on who is authorized to certify the inspection has been

done and a mast is safe for use.

The concept of good engineering practice
The annual inspection and certification of a mast is required by the *Regulation*. This inspection is to be done in accordance with good engineering practice. The concept of good engineering practice as it applies to this section means the inspection, assessment, repair (if necessary), and certification of the equipment is to be done in consideration of the following:

- Applicable regulations, safety codes, and standards (e.g., *CAN/CSA-Z151-09 Concrete pumps and placing booms* Clause 5 inspection requirements for structural support systems)
- Manufacturer's instructions for operation, inspection, maintenance, servicing, and repair
- Operating, maintenance, and service records

Who may do the certification
Certification will generally be done by a professional engineer. If the inspection, assessment, and any necessary repair work is done in B.C., the engineer, as required by the *Professional Governance Act*, must be licensed to practice in B.C. If this work is being done outside B.C., for example in Alberta, the engineer must be licensed to practice in that jurisdiction.

If the certifying agent is a manufacturer's representative, the person signing the certification should be specifically authorized in writing by the manufacturer to make such a certification on behalf of the manufacturer.

For convenience, the professional engineer or equipment manufacturer's representative will be referred to as the "certifying professional" in the remainder of this guideline.

The inspection and certification process
The employer or owner of the equipment should consult the certifying professional in advance to arrange the location of the inspection, testing, and necessary repair work, and to ensure qualified people and adequate facilities are used. Generally the "hands on" part of the inspection, testing, and repair will be done by mechanics, service technicians, non-destructive testing (NDT) technicians, and other qualified workers as necessary (for example, welders), working under the direction of the certifying professional.

Inspection and certification requires the assessment of the "critical components," meaning the structural, mechanical, and control system components which affect the safe operation of the equipment. The specific identity of these components will vary from one type of equipment to another, depending on the design and configuration of the equipment. Only the applicable components must be inspected and certified e.g., a stationary lattice structure mast does not have mechanical and control system components whereas a self-climbing mast would have electrical and/or hydraulic control system components.

The frequency of inspections of individual components and the extent of the inspection, including dismantling, assessment, and NDT or other testing, will be determined by the certifying professional. The factors relevant in making these determinations include the following:

1. Requirements of the applicable regulations, safety codes, and standards
2. The equipment manufacturer's specifications and instructions
3. The certifying professional's familiarity with the particular design and model of equipment, including known reliability problems or component problems
4. Previous inspection history and results
5. Age of the equipment and number of hours of use
6. Circumstances of use of the equipment (for example, heavy duty vs. light use) and any known incidents since the last certification
7. The general condition of the equipment
8. The available use, service, inspection, and maintenance records
9. The certifying professional's knowledge of the overall effectiveness of the service and maintenance program

Based on the outcomes of the inspection, the certifying professional will determine any necessary repair work.

The certification document will include a statement that the equipment is "safe for use" at the completion of the inspection and any necessary repair work. This means that the equipment should then reasonably be expected to perform safely until the next inspection and certification is required if operated according to the manufacturer's instructions.

If the certifying professional deems it necessary to provide a restricted certification statement (for example, that some components are currently acceptable for safe use but will likely require replacement or renewal before the next annual inspection), the certifying professional will ensure the owner or employer is made aware of these concerns and will also note the condition on the equipment inspection and maintenance records. It is not acceptable for the certifying professional to provide a certification when there are outstanding deficiencies affecting the safe performance or compliance of the equipment with the *Regulation*.

Issued July 14, 2020; Editorial Revision consequential to August 22, 2022 Regulatory Amendment

Regulatory excerpt

Sections 20.47(2)-(4) of the *OHS Regulation* ("*Regulation*") state:

> (2) A concrete pump and placing boom must be inspected in accordance with good engineering practice at intervals not exceeding 12 months to ensure that they meet
>
> (a) the manufacturer's specifications,
>
> (b) the requirements of the applicable standard referred to in section 20.26.3, and
>
> (c) the requirements of this Regulation.
>
> (3) Without limiting subsection (2), an inspection under that subsection must include an inspection of the structural, mechanical and control system components of the concrete pump and placing boom.
>
> (4) On and after January 1, 2021, a concrete pump and placing boom must not be used after an inspection under subsection (2) unless a professional engineer certifies that, on the basis of that inspection, they are safe for use.

Purpose of guideline
The purpose of this guideline is to outline some of the factors that should be considered when determining if an inspection has been conducted in accordance with "good engineering practice" under sections 20.47(2)-(4) of the *Regulation*. It also provides information on who is authorized to certify that the inspection has been done and that the concrete pump and placing boom are safe for use.

Good engineering practice
The Engineers and Geoscientists of BC (EGBC), in its professional practice guideline titled *Annual Equipment Inspection and Certification in British Columbia*, describes the standard of practice that engineering professionals should follow when carrying out equipment inspections and certifications. WorkSafeBC considers following this EGBC guideline as following good engineering practice for annual inspections and certifications of concrete pumps and placing booms.

A copy of the EGBC's professional practice guideline can be accessed here - *Annual Equipment Inspection and Certification in British Columbia.*

Certification
On and after January 1, 2021, certification must be done by a professional engineer. If the inspection, assessment, and any necessary repair work are done in B.C., the professional engineer, as required by the *Professional Governance Act*, must be licensed to practice in B.C. If this work is being done outside B.C., for example in Alberta, the professional engineer must be licensed to practice in that jurisdiction.

Inspection and certification process
The EGBC has defined the annual inspection and certification process for the concrete pump and placing boom in its professional practice guideline - *Annual Equipment Inspection and Certification in British Columbia*.

G20.72 Open web joists and trusses

Issued August 1999; Revised August 29, 2016

Regulatory excerpt
Section 20.72 of the *OHS Regulation* ("*Regulation*") states:

> (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).

Purpose of guideline
The purpose of this guideline is to clarify the intent of section 20.72 of the *Regulation* and to provide a list of reference materials.

Erection of open web joists and trusses
The erection of open web joists and trusses is often performed without adequate (or any) written instructions. The erector receives, with the shipment of trusses, a set of truss design drawings that are appropriate for submission to the building inspector. Typically, these drawings indicate permanent bracing requirements but do not address any procedure or need for temporary bracing.

Work on truss erection should not continue if any of the following conditions exist:

(a) Erection and bracing instructions are not available at the site or are obviously incomplete

(b) Work is not being done in accordance with the erection and bracing instructions

(c) Walls or skeletal structural building frame is inadequately braced

(d) Damaged trusses (those with damage such as twisted webs, bent connector plates, cracked chords) are being or have been installed

(e) Heavy loads are being applied to trusses before all bracing, bridging, and decking have been installed

It should be noted that, under section 20.72 of the *Regulation*, erection includes the hoisting of a partial or entire roof, floor, or other component sections (for example, where a roof is prefabricated on the ground as a unit in one or more pieces and is then hoisted with a crane into position on the building). This operation requires written instructions from a professional engineer or the truss manufacturer detailing all bracing needed for the lift, and the location and construction of the lifting points, complete with rigging details as necessary for the safe lifting of the roof. This applies to open web joists and trusses of any composition, such as wood, metal, or other material.

Reference materials
The following reference materials may be helpful:

- The Western Wood Truss Association's instructional *Handling, Installation and Bracing of Wood Trusses* (each member of the Association provides a copy to each site with each truss shipment)
- Publications by the Structural Building Components Association, Truss Plate Institute, and Truss Plate Institute of Canada:
  - Building Component Safety Information BCSI Canada — Guide to Good Practice for Handling, Installing, Restraining and Bracing of Metal Plate Connected Wood Trusses
  - BCSI-B1C Summary Sheet — Guide for Handling, Installing, Restraining and Bracing of Trusses
  - BCSI-B2C Summary Sheet — Truss Installation and Temporary Restraint/Bracing
  - BCSI-B3C Summary Sheet — Permanent Restraint/Bracing of Chords & Web Members
  - BCSI-B7C Summary Sheet — Guide for Handling, Installing and Bracing of 3x2 and 4x2 Parallel Chord Trusses
  - BCSI-B11C Summary Sheet — Fall Protection & Trusses
- Publications by the Canadian Wood Council:
  - Wood Design Manual
  - Introduction to Wood Design
  - Engineering Guide for Wood Frame Construction
  - Canadian Span Book
- Publication by the Manufacturerâ€™s Health and Safety Association:
  - Structural Steel Erection Best Practices

G20.75 Roof work – Fall protection

Issued August 1999; Revised January 1, 2005; Revised February 19, 2016

Regulatory excerpt
Sections 11.2(2) to 11.2(5) of the *OHS Regulation* ("*Regulation*") state:

> (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 a fall arrest system is used.
>
> (5) If the use of a fall arrest system is not practicable, or will result in a hazard greater than if the 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.

Section 20.75 of the *Regulation* states:

> 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.

Purpose of guideline
This guideline describes different fall protection systems for work on roofs, according to the amount of slope, using the hierarchy in section 11.2 of the *Regulation*. Sections 20.74 to 20.77 also need to be considered for roof work.

Fall protection systems suitable for each type of roof
The general effect of sections 20.74 to 20.77 and Part 11 of the *Regulation* is to create three categories of roofs as illustrated in Figure 1 and to provide for different fall protection systems available to be used for each category.

FIGURE 1: THREE CATEGORIES OF ROOFS

1. Fall protection available for flat roofs and roofs up to and including 4 vertical to 12 horizontal:

- guardrails,
- personal fall protection systems,
- safety nets,
- control zone,
- safety monitor system with control zone, or,
- other acceptable work procedures.

2. Fall protection available for roofs with a slope ratio greater than 4 vertical to 12 horizontal but less than 8 vertical to 12 horizontal:

- guardrails,
- personal fall protection systems,
- safety nets, or
- other acceptable work procedures.

The control zone and safety monitor systems are not to be employed on roofs steeper than 4 vertical to 12 horizontal. (See OHS Guideline G11.2(5)-1.)

3. Fall protection available for roofs where the slope ratio is 8 vertical to 12 horizontal or greater

- if the roofing material allows for the nailing of toe-holds, they must be used, in conjunction with personal fall protection systems or personnel safety nets, as required by section 20.75 of the *OHS Regulation*, and
- if the roofing material precludes the use of toe-holds, such as on metal panel, metal tile, or concrete tile, workers should use appropriate roof ladders or acceptable work platforms in conjunction with a personal fall protection system.

Toe-holds are properly oriented with the 6-inch side perpendicular to the roof. Attachment of toe-holds to the roof will typically be accomplished by using manufactured roof jacks according to the manufacturer's instructions. Another method may be to construct an "L" using a 2x4 and 2x6 and securely fastening this L to the roof, as illustrated in Figure 2. The attachment will need to be suitable for the roof and the application, provide safe footing, and be able to withstand any forces likely to be imposed on it. Toe-nailing a 2x6 to the roof is not an acceptable method of securing toe-holds.

FIGURE 2: CONSTRUCTING AN "L" ON A ROOF

It should be noted that toe-holds are intended for worker positioning, and are not to be used for the purpose of storing any material other than what is reasonably required to complete the work at hand.

Reference should be made to the particular sections of the *Regulation* governing the methods of fall protection listed above to determine when exactly they can be used and under what conditions.

G20.77 Mechanical equipment

Issued August 1999, Editorial Revision August 2004; Editorial Revision June 30, 2021

Regulatory excerpt
Section 20.77 of the *OHS Regulation* ("*Regulation*") states:

> 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.

Purpose of guideline
The purpose of this guideline is to provide guidance to the application of section 20.77 of the *Regulation*.

Application
Section 20.77 of the *Regulation* is not intended to apply to small hand tools such as electric drills. It does apply to larger pieces of equipment such as power sweepers. Section 4.3 of the *Regulation* requires that equipment must be used and maintained in accordance with the manufacturer's instructions.

Proximity to unguarded edge
The equipment should not be used closer than 2 metres (6.5 feet) to the unguarded edge where a safety monitor or other type of work procedure is being used as a fall protection system. The manufacturers of roofing equipment covered by this section typically specify a limit of about this amount in their instructions. If the instructions specify a limit greater than 2 metres, section 20.77 requires that limit be maintained.

G20.78 Qualified registered professional and engineering documents

Issued August 1999; Editorial Revision February 7, 2006; Formerly Issued in G20.78(2) - Re-issued as G20.78 January 1, 2009

Regulatory excerpt

Section 20.78 of the *OHS Regulation* ("*Regulation*") states:

> (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.

Purpose of guideline
The purpose of this guideline is to provide information about what is considered acceptable for written instructions required by section 20.78 of the *Regulation*.

Written instructions
Verbal instructions from a qualified registered professional with no supporting documents are insufficient.

The following should be included as a minimum for a qualified registered professional's certificate on a site under this section:

- Date of issue
- Site address/location
- Drawing/sketch, plan, and sections and/or clearly written instructions
- Geotechnical description of the expected soil conditions, or confirmation upon site review
- Limitations for machinery or equipment being adjacent to the excavation
- Time period for which certification applies
- Influence of changing weather conditions
- Name of the certifying qualified registered professional, signature, and seal

Subsequent certifications may refer back to the initial certification documents, in which case such documents shall be available at the site. If conditions and/or instructions change with respect to the conduct of the excavation work, supplementary instructions and documentation are required.

If the certification is incomplete or deemed inadequate, work should stop in the hazard area until acceptable certification is available, or until remedial work is done so that the excavation complies with the *Regulation*.

G20.78(1)(c) Vibration, hydrostatic pressure or hazardous ground movement

Issued August 1999; Editorial Revision June 6, 2007; Formerly Issued as G20.78(1) - Re-issued as G20.78(1)(c) January 1, 2009

Regulatory excerpt

Section 20.78(1)(c) of the *OHS Regulation* ("*Regulation*") states:

> (1) Subject to this section, excavation work must be done in accordance with the written instructions of a qualified registered professional if
>
> (c) the excavation is subject to vibration or hydrostatic pressure likely to result in ground movement hazardous to workers,

Purpose of guideline
The purpose of this guideline is to provide some explanation of the terms "subject to vibration" and "hydrostatic pressure likely to result in ground movement."

Explanation of "subject to vibration"
An excavation may be considered "subject to vibration" under section 20.78(1)(c) if there is activity such as heavy vehicle traffic, blasting, road compaction equipment, or compaction during backfill placement close to the excavation. The severity of the vibrations as well as the distance

between the activity to the excavation shall be considered.

Hydrostatic pressure and hazardous ground movement
Hydrostatic pressure is a concern if water is coming out of the sides or base of an excavation. Engineering or other work done in accordance with the written instructions of a qualified registered professional is required unless an effective dewatering system can be implemented. If water ingress can be prevented by the use of a dewatering system, hydrostatic pressure should not be a problem. Using a water pump to remove nominal surface runoff (such as from rainfall) should be acceptable without engineering or other work done in accordance with the written instructions of a qualified registered professional. If the soil adjacent to an excavation has undergone significant changes in moisture content, the stability of the excavation sides may be in question. Soil that is frozen, or may freeze due to the ambient air temperature during the excavation work, may cause development of hydrostatic pressure and thus such excavation work should only be undertaken following a qualified registered professional's instructions.

G20.78(1)(d) Ground slope adjacent to excavation work

Issued February 22, 2005; Formerly Issued as G20.78(1)(e) - Re-Issued as G20.78(1)(d) January 1, 2009; Editorial Revision consequential to September 1, 2021 Regulatory Amendment

Regulatory excerpt
Section 20.78(1) of the *OHS Regulation* ("*Regulation*") states:

> (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.

Purpose of guideline
The purpose of this guideline is to discuss section 20.78(1)(d) of the *Regulation* as it applies to excavation work that must be done in accordance with the written instructions of a qualified registered professional.

Specific circumstances of general sloping and shoring
The requirements under section 20.78 address certain circumstances where the general sloping and shoring requirements under section 20.81 of the *Regulation* do not provide adequate protection for the safety of workers. In these special circumstances, a qualified registered professional is required to oversee assessment of the site and provide written instructions about performance of the work.

This guideline discusses the circumstance set out in 20.78(1)(d) – as it applies to construction or maintenance work performed along an established road or other similar right of way.

Ground slopes from edge of excavation
The intent of section 20.78(1)(d) of the *Regulation* is to address the hazards arising from situations where the ground slopes up or down from the top edge of an excavation. Where the ground slopes up, the concern is for the increase in lateral ground pressure that arises due to the weight of soil positioned above a 3 horizontal to 1 vertical slope. This weight is an extra load that has not been allowed for in the sloping and shoring requirements specified in section 20.81 of the *Regulation*. Where the ground slopes down and away, the concern is the lack of adequate lateral support on the downhill side for any bracing specified in section 20.81 positioned against the downhill excavation face.

The control of surface runoff and soil erosion may also be a concern. These concerns arise particularly when the excavation work will be a side hill cut, bulk excavation, or a trench other than in a direction in line with the natural ground slope. Stated another way, if the excavation will generally be "across" the slope in a manner that will change the cross section profile of the slope, section 20.78(1)(d) will apply.

The slopes along a right of way will generally have been designed to provide stable faces to the extent necessary to balance safe and economical functioning of the right of way. Where the right of way was not so designed, but has been in place for at least a year (one full season cycle of rain and/or freezing weather as applicable for the geographical area), the slopes should have reached a natural, stable state. Any excavation activity that will alter the design profile, or naturally stable profile, of a cross section of a slope is within the scope of section 20.78(1)(d).

Excavation work that does not change the cross section of the slope
Some maintenance or construction activities along a right of way may involve minor or localized excavation work that will not alter the "general" cross section profile of a slope in a manner that would affect the overall stability of the slope. Some examples of excavation activity of this type are

- Installing a utility pole, lamp standard, or signpost through use of an auger, drill, or similar device to dig a "post hole" or use of a back hoe or other equipment to dig a "bell hole"
- Cleaning out a drainage ditch or clearing a buffer zone to restore the original design profile and grade
- Installing or repairing a shallow culvert running generally in line with the natural ground slope (or perpendicular to the centre line of the right of way)

- Shouldering work, profiling a road surface, or similar minor excavation work within a compacted roadway
- Excavating a "bell hole" to repair a buried pipe or similar service

These excavations generally do not require any additional or special sloping or shoring considerations as the dimensions of the excavation are generally small enough that the natural "bridging action" of the soil provides enough support. Also, in most of these cases a worker does not enter into the actual excavation. These types of excavation activities generally do not require any written instructions from a qualified registered professional.

It must be remembered however, that the hazard of loose material (such as rocks, logs, or trees) coming down from a slope above always needs to be evaluated and considered whenever work is being done near the base of the slope. Also, hazards may develop from weather conditions, such as extreme rainfall, or the potential for an avalanche. A "tailboard" or "tool box" meeting should be held with the crew to discuss the conditions in the planned work area prior to starting work. Loose material and weather condition hazards need to be assessed by a qualified person at least daily and preferably, before each work shift. The condition of the slope above must be examined and any loose material that could be a hazard should be removed or stabilized before work starts. If the daily assessment raises any concern regarding the overall stability of the slope, a qualified registered professional's assessment and advice should be obtained.

Excavation work that will change the cross section of the slope
There are some excavation activities related to servicing and maintaining a right of way that involve work at or near the base of an unstable or potentially unstable slope and will alter the overall cross section of the slope. Two examples of such activity are slope stabilization and the removal of rock or mud slide material. Prior to starting such work, a qualified registered professional should oversee the assessment of the conditions in the area to determine if there is a significant risk of substantial material flow (either immediately or as the work proceeds) that could endanger workers.

If the qualified registered professional determines there is a significant risk, written instructions on how to proceed (covering aspects such as the sequence of work, selection of equipment, and work methods) need to be obtained from the qualified registered professional.

If the qualified registered professional determines there is only a minimal risk of a substantial material flow, the work plan can be developed without further input from the qualified registered professional. Work of this type generally involves powered excavating equipment that is substantial in size and affords protection for the operator in the event of any minor material flow. If there is a danger of logs, trees, or other debris coming down the slope, operators of mobile equipment must be protected by suitable cabs, screens, grills, shields, guards or structures (refer to section 16.33 of the *Regulation*). It is necessary that such operations be carried out, as far as is practicable, so that the height of any unstable face being worked does not exceed the maximum safe reach of the excavating equipment being used (refer to section 20.93 of the *Regulation*).

Pedestrian workers should stay clear of the working face, any other unstable faces, and operating equipment.

Rock scaling
Rock scaling is a form of excavation, but is not generally an activity that will change the cross section profile of a slope. Scaling of slopes is not an activity normally considered within the scope of section 20.78, and is specifically addressed in sections 20.96 to 20.101 of the *Regulation*. If there is a concern regarding the overall stability of a slope that is to be scaled, a qualified registered professional's assessment and instructions should be obtained and followed.

G20.79 Underground utilities

Issued August 1999; Editorial Revision August 2004; Revised February 13, 2006; Revised February 24, 2006; Revised August 11, 2010; Editorial Revision to include February 1, 2011 Regulatory Amendment; Revised July 27, 2016; Editorial Revision April 6, 2020; Editorial Revision December 4, 2025

Regulatory excerpt

Section 20.79 of the *OHS Regulation* ("*Regulation*") states:

> (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.

Section 4.18 of the *Regulation* states:

> 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.

Purpose of guideline
The purpose of this guideline is to:

- Explain how to obtain locate information
- Describe the use of hydrovacing to expose underground utilities
- Highlight some jurisdictional considerations
- Explain the occupational health and safety obligations of employers when their work activities result in a hit or damage to a pipeline, buried electrical cable, or other such utility

Obtaining locate information
An effective way to accurately determine the location of all underground utility services in the area is to contact BC 1 Call. BC 1 Call is the communication link between the ground disturbance community and the owner/operator of underground facilities who are registered members of BC 1 Call.

BC 1 Call contact information:
Toll-free: 1-800-474-6886
Email: info@bc1c.ca
www.bc1c.ca

Not all utility companies are members of BC 1 Call. If the company is not listed on the BC 1 Call member list, anyone proposing to undertake a ground disturbance must reach out directly to the public or private sector owner of underground infrastructure known to have, or suspected of having, assets within the community where the proposed dig site is located.

Use of hydrovacing equipment for locating buried utilities
Hydrovacing is the use of pressurized water to liquefy and loosen soil, which is then removed using on-truck vacuum systems and hoses. It can be an effective, efficient, and safe means of accurately locating and exposing ("daylighting") underground utility lines.

When performed in conformity with the requirements, restrictions, and prohibitions of the utility owner, and following safe work procedures that adequately address hazards that workers may be exposed to, hydrovacing can be as safe as hand digging. It is important to have the locate information and any necessary permits prior to hydrovacing.

Note that each utility owner and regulator may have its own requirements or prohibitions, and employers performing hydrovacing need to be aware of and adhere to these rules.

Other legislation governing excavations near underground utilities
Jurisdictions other than WorkSafeBC also have statutes and regulations that apply to excavation or drilling in proximity to an underground utility service. For example, the *Gas Safety Regulation* specifies the means by which anyone excavating near a gas installation must determine the existence of underground gas services and the methods that excavators must use to find the exact location of services.

Refer to *OHS Policies Item P1-2-1 Application of the OHS provisions of the Act - Where Jurisdictional Limits Exist* for guidance on how WorkSafeBC prevention officers will exercise their powers in situations where there are jurisdictional limits on those powers.

***Regulation* requirements if contact with any underground facility occurs**
Notify the owner of the utility without delay
Section 4.18 of the *Regulation* requires that 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.

Notify WorkSafeBC where required
Damage to underground facilities can cause death or serious injury to a worker. Section 68 of the *Workers Compensation Act ("Act")* specifies the accidents that an employer must immediately report to WorkSafeBC, including any accident that results in serious injury or death of a worker, or involves the major release of a hazardous substance.

An important factor in determining whether there is a major release of a hazardous substance is the seriousness of risk to the health of workers that the release presents. Policy includes some factors that determine the seriousness of the risk. Situations involving natural gas that should be considered a "serious risk" include the following:

- It was necessary for people to be evacuated from buildings
- Gas seeped into sewers or drains
- Any person required medical treatment
- The gas leak ignited
- Repair workers entered the gas envelope when the atmosphere contained flammable gas or vapor concentrations in excess of 20% of the lower explosive limit (LEL)
- A worker (other than a gas company worker) entered an excavation after a strike to attempt to stop or slow the flow of gas

Policy Item P2-68-1 Accident Reporting and Investigation - Major Release of Hazardous Substance discusses the meaning of the "major release of a hazardous substance" under section 68 of the *Act*.

Investigate the incident
Under section 69 of the *Act* employers must immediately undertake an investigation into the cause of any accident or incident that had a potential for causing serious injury to a worker. Any gas line hit or high voltage contact is likely to fall into this category and an investigation is required.

Also, under section 69 of the *Act* the employer must investigate the occurrence of any accident that involved the major release of a hazardous substance. Refer to section 69 of the *Act* for additional incidents that employers must investigate.

G20.81 Sloping and shoring requirements

Issued August 1999; Editorial Revision August 31, 2007; Editorial Revision January 1, 2009

Regulatory excerpt
Section 20.81(1) of the *OHS Regulation* ("*Regulation*") states:

> 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.

Purpose of guideline
The purpose of this guideline is to provide explanatory material for the *Regulation* requirements in sub-sections 20.81(a)–(f).

Explanatory information for subsections 20.81(a)–(f)
This section is subject to section 20.78, which requires written instructions from a qualified registered professional in certain situations.

"Excavation" is defined in section 20.1 as meaning any "cut, cavity, trench or depression in the earth's surface resulting from rock or soil removal." This includes, for example, a hole dug in the ground, as well as the cutting of material away from a slope, such as occurs on roadway construction.

Section 20.81 requires that one of clauses (a) to (f) be met in all cases where an excavation over 1.2 m (4 ft) deep has a width that is equal to or less than twice its depth. If the excavation is wider than twice its depth, this will only have to be done if the worker will approach "closer to the side or bank than a distance equal to the depth of the excavation." The latter includes situations where there is no measurable width because the excavation is, for example, a cut into a slope. In these situations, the worker must enter and exit the excavation by a safe route, for example, a properly sloped or shored portion of the excavation.

Section 20.81(1)(e) refers to section 20.85. Section 20.85, and by reference Table 20-1, contain detailed specifications for "trench support structures." A "trench" is defined in section 20.1 as "an excavation less than 3.7 m (12 ft) wide at the bottom, over 1.2 m (4 ft) deep, and of any length." Section 20.81(1)(c) and section 20.85 do not apply to excavations over 12 feet wide, or excavations that have no measurable width.

Section 20.81(1)(f) permits the use of manufactured or prefabricated trench boxes or shoring cages. These may be used in accordance with the manufacturer's instructions or engineering certification for the device, unless the instructions for use do not adequately include the circumstances of use or questions arising at the site, or where the situation is covered in the scope of section 20.78. The instructions for use and/or certification of a trench box or cage should specify the types of soil conditions for which it is intended and the instructions relating to each. A copy of this information should be on site.

Section 20.81(1)(f) also permits the use of "other effective means." Means of shoring other than "manufactured or prefabricated trench boxes or shoring cages" referred to under section 20.81(f) should be done in accordance with the written instructions of a professional engineer under section 20.81(d).

G20.85 Trench support structures

Issued August 1999; Editorial Revision January 1, 2009

Regulatory excerpt
Section 20.85 of the *OHS Regulation* ("*Regulation*") states:

> (1) Trench support structures, other than those designed by a professional engineer, must comply with Table 20-1 for the following relevant soil conditions:

Soil type	Description of soil

A	hard and solid
B	likely to crack or crumble
C	soft, sandy, filled or loose

(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 dislodgement.

(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.

(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.

Purpose of guideline
The purpose of this guideline is to provide information about requirements for trench support structures and types of soil. The guideline also provides information about combining sloping and shoring.

Trench support structures and soil type
Section 20.85 of the *Regulation* and its accompanying tables and figures set out detailed requirements for trench support structures required under section 20.81(1)(e). Any trench support structures not covered by these requirements, other than "manufactured or prefabricated trench boxes or shoring cages" allowed by section 20.81(f), must be covered by a professional engineer's certificate under section 20.81(d).

The requirements of section 20.85 depend on the type of soil. Type A soil is described in the section as "hard and solid." No soil is type A if it:

- Is fissured
- Is subject to vibration from heavy traffic, pile driving, or similar effects
- Has been previously disturbed
- Is part of a sloped or layered system where the layers dip towards the excavation on a slope of 4H:1V or greater
- The material is subject to factors that would require it to be classified as a less stable material

Type C soil is described in section 20.85 as "soft, sandy, filled or loose." It typically has a low, unconfined compressive strength. It can be

- A granular soil, including gravel, sand, and loamy sand
- Submerged soil or soil from which water is freely seeping
- Submerged rock that is not stable
- Material in a sloped, layered system where the layers dip towards the excavation on a slope of 4H:1V or greater

A more detailed, technical classification of soil types is available in Occupational Safety and Health Administration (OSHA) Part 1926, Subpart P, Appendix A. Visual and testing parameters are provided for analysis.

Combination of sloping and shoring
Section 20.85(2) and Figure 20-3 specify an option if a combination of sloping and shoring is to be used. The following additional information may

help clarify the relationship between H, the 1:1 slope, and the 1.5H horizontal dimension in Figure 20-3. If the broken reference line extending on a 1:1 slope from the toe or base of the excavation meets the surface of undisturbed ground within a distance of 1.5 times the depth of the trench, the trench support structures specified by section 20.85 can be used. If not, the original ground slopes upward steeper than a 1 vertical in 3 horizontal slope, and a professional engineer's certificate must be obtained under section 20.81(d) and followed.

G20.102 Suspended work platforms in marine construction and pile driving activities

Issued May 17, 2006

Regulatory excerpt
Section 20.102 of the *OHS Regulation* states:

> (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 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.

Purpose of guideline
This guideline provides information on the circumstances under section 20.102(2)(a) in which WorkSafeBC expects it will be practicable to use a second crane or other hoist as a means for positioning workers to perform work tasks, and when it will not be practicable. The term "practicable" is defined in the *OHS Regulation* to mean "that which is reasonably capable of being done." The guideline also provides information on the application of section 20.102(2)(b).

Practicability of using a second crane or other hoist
The issue of practicability varies somewhat depending on whether the operations are done using equipment based on the ground or a dock, or are performed using equipment based on a barge, scow, or similar floating support.

1. **Operations where equipment is used on the ground or a dock:** It is *generally considered practicable* to use a second crane, a boom-supported elevating work platform, or other safe means to position workers to do tasks at height unless the area does not provide sufficient space or there are conditions that do not permit safe positioning of additional equipment. Examples of such cases include operations done on ground where access is limited or soil conditions preclude the use of additional equipment, and those done from a narrow wharf, jetty, or dock area with substantial space restrictions.

   If the space is adequate for the operation of a second crane or other hoisting device, it may still not be practicable to bring in the second piece of equipment if the work is extremely short in duration or involves only a few lifts and is incidental to the job. Two examples are noted below.
   - The work is solely for the purpose of routine maintenance on the crane, pile driver, or leads. For example, if it is necessary to re-thread a pile line on the leads, or to access the upper sheaves of the crane for maintenance such as lubrication, the use of a work platform suspended on a second load line while the pile driver and/or leads remain supported by another load line of the crane is considered normal and acceptable practice.
   - During marine construction and pile driving work there may be other short duration lifting tasks that need to be done, for example the top of a light standard may need to be installed or removed. For such tasks the pile driver and leads are disconnected from the crane, rendering the crane available for use in its usual or normal configuration, with one load line supporting workers in a platform and the other line used to position or support the part to be installed or removed.

     However, if such crane tasks are more than incidental, for example the work will take more than a day, and equipment such as a second crane or a boom-supported elevating work platform is reasonably available to the site, WorkSafeBC expects the work to be planned and executed in a manner that complies with section 13.27(5).

2. **Operations where equipment is used on a barge or scow:** It is *generally considered not to be practicable* to use a second crane to lift a work platform or use an elevating work platform when operations are done from a barge, scow or similar floating equipment.

   For example, if the secondary equipment is placed on the same barge or scow there usually will not be sufficient space to safely position the equipment. Also, in the case of an elevating work platform, it may not be possible to assure that the elevating work platform carrier will remain level within the limits normally required for safe operation of such equipment, in circumstances where there is listing of the barge or scow resulting from loads being handled by the crane, or as a result of wind and wave action.

   If the secondary equipment is placed on another barge or scow, or on a nearby dock or land area there may be hazards to workers created from the relative movement of the two pieces of lifting equipment, as a result of the listing of the barge or scow from loads being handled by

the crane, or from wind and wave action.

Intention of section 20.102(2)(b)
This provision references section 13.29(1) of the *OHS Regulation*, and broadens the application of the requirements under that section to all hoisting gear, including the primary line, the line used to lift workers and, where applicable, the boom hoist. In other words, all hoisting lines must be operated as slowly as practicable when workers are being lifted on the platform and must be lowered under power, and no line may be used with a free running boom or hoisting winch controlled only by brakes. Section 13.29(2) and (3) continue to apply, but only to the line used to lift workers.

G20.112 Hazardous materials – Asbestos

Issued June 18, 2008; Revised consequential to February 1, 2012 Regulatory Amendment; Revised consequential to February 1, 2015 Regulatory Amendment; Editorial Revision consequential to May 1, 2017 Regulatory Amendment; Revised May 29, 2018; Editorial Revision April 6, 2020; Revised July 20, 2023; Revised consequential to January 1, 2024 Regulatory Amendment; Editorial Revision July 10, 2025

Regulatory excerpt
Section 20.112 of the *OHS Regulation* ("*Regulation*") states:

(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.

Purpose of guideline

Demolition, renovation, and salvage work involve the taking apart and destruction, in whole or in part, of buildings, structures, equipment, and machinery. These processes have the potential to create harmful exposures to hazardous materials. Section 20.112(1) of the *Regulation* lists several types of hazardous materials which must be identified and either safely contained or safely removed prior to demolition, renovation, or salvage work. Asbestos is one of these materials.

The purpose of this guideline is to explain the hazards associated with the uncontrolled release of asbestos. It also provides information for owners, employers, consultants, workers, and other involved persons on what constitutes a compliant asbestos inspection, arranging for and confirming the safe abatement of asbestos, and what to do if additional materials suspected to contain asbestos are encountered during demolition, renovation, or salvage work.

Demolition work is often a necessary component of restoration work following a fire or flood, and the requirements of section 20.112 of the *Regulation* and the information in this guideline also apply when demolition work is part of restoration work.

Background information

Demolition, renovation, and salvage work, if performed incorrectly, can create harmful asbestos exposures to a variety of workers and other persons, including owners, developers, demolition, renovation, and salvage workers, inspectors, transportation workers, landfill workers, and the public. If demolition of a house or building proceeds without first ensuring the identification and safe removal of the asbestos hazards, asbestos fibres can be released, and remain airborne for a long period of time, potentially exposing workers. During the demolition of the interior walls and ceilings, the demolition, renovation, or salvage work, workers may be exposed to airborne asbestos fibres in the dust from the gypsum board filling compound (sometimes called drywall mud) and from textured ceilings and walls. Vermiculite attic insulation containing asbestos fibres can spill out of the attic when the ceiling material is removed. Asbestos-containing dusts from these activities can contaminate the site and disperse to neighbouring properties exposing other persons. As asbestos-containing debris is loaded into a disposal truck, the excavator operator and the truck driver can be exposed to asbestos-containing dusts which can also drift into neighbouring properties. As the disposal truck travels to the landfill site, dust that contains asbestos can blow out of the truck, spreading asbestos dust along its travel route. When the truck discharges its asbestos contaminated load at the landfill, unprotected landfill site workers can be exposed to the airborne hazard. These work practices are unacceptable and non-compliant with the *Regulation*.

Asbestos hazards must be controlled through the identification and safe abatement of asbestos, by trained and certified persons, before demolition, renovation, or salvage work. This guideline provides information for acceptable identification, assessment, reporting, and removal of asbestos hazards in buildings and structures (refer also to the "10 Steps to Compliance" chart at the end of this guideline).

The requirements in section 20.112 of the *Regulation* are related to other requirements in both the *Regulation* and the *Workers Compensation Act* ("*Act*"). For example, when asbestos is removed, other requirements in Part 6 Asbestos of the *Regulation* are also applicable. The requirements in sections 21 (General duties of employers) and 25 (General duties of owner) in the *Act* also apply.

More information related to asbestos hazard assessment and control measures for building demolition, renovation, and salvage work can be found in the following:

- OHS Guideline G6.8 "Procedures for abatement of asbestos materials during house and building demolition/renovation"
- WorkSafeBC publication BK27 *Safe Work Practices for Handling Asbestos*
- WorkSafeBC hazard bulletin *WS03-03 Asbestos Hazards in Demolition, Renovation and Salvage*

Asbestos licensing and certification requirements
In 2024, WorkSafeBC implemented a mandatory licensing requirement for asbestos abatement work to help keep workers safe from exposure to asbestos.

An employer must hold a valid asbestos licence to conduct asbestos abatement work as defined in the *Act*.

A person must take mandatory training and hold a valid certificate for the type of asbestos abatement work they conduct. Refer to the OHS Guideline G6.2.1 for descriptions of the types of asbestos abatement work and the corresponding asbestos certificate levels required.

For more information on the licensing and certification requirements, refer to the Asbestos training, certification & licensing webpage on worksafebc.com.

Responsibilities and qualifications
Sections 20.112(2), (4), (5), (6), and (7) of the *Regulation* specify explicit responsibilities for the owner and the employers. Pusuant to section 30 of the *Act*, these parties need not duplicate the same compliance efforts providing they coordinate their actions to ensure that compliance with all provisions of section 20.112 is achieved. The following table summarizes which workplace parties, if any, are primarily responsible for the regulatory requirements, but not be limited to those on the list:

Obligations	Who's responsible (where applicable)
Ensure that a hazardous materials inspection is completed by a qualified person	Owner or owner representative Employers such as the following: Prime contractor Demolition contractor Salvage contractor Abatement contractor Renovation contractor Builder
Ensure that a written inspection report and other required documentation is available at the worksite	Owner or owner representative Employers such as the following: Prime contractor Demolition contractor Salvage contractor Abatement contractor Renovation contractor Builder Employers of other workers on site
Conduct the hazardous materials inspection in an appropriate manner	Certified asbestos surveyor (commonly a licensed hazardous materials consultant)

Safely contain or remove hazardous materials	Licensed abatement contractor Licensed salvage contractor Licensed demolition contractor Licensed renovation contractor
Provide written confirmation that the hazardous materials have been safely contained or removed	Qualified person (may be a different person than the qualified person conducting the hazardous materials inspection)

Prior to asbestos removal occurring, all employers responsible for the work, as well as the owner or prime contractor must ensure that a notice of project (NOP) for asbestos, as required under section 20.2.1 of the *Regulation*, is submitted to WorkSafeBC at least 48 hours in advance of the actual removal of asbestos, including any preparatory work. The NOP must include detailed written safe work procedures and a written hazardous materials inspection report as required under sections 20.112(3)(e) or 20.112(6)(e) of the *Regulation*. Only one NOP needs to be submitted. Section 6.2.3 also states that the owner and the prime contractor must ensure that the asbestos abatement contractor holds a valid licence to perform asbestos abatement work.

Under sections 20.112(2), (3), and (6) a qualified person has responsibilities regarding inspection, sample collection, identification, and report-writing. The qualifications required by the person fulfilling these requirements are defined in section 20.112(1). In addition to education, training, knowledge, and experience, the qualified person conducting a survey for asbestos-containing materials would require a valid Level S certificate to perform that work. It should be noted that having a Level S certificate, without the education, training, and experience in the management and control of hazardous materials, is not sufficient to meet the definition of a qualified person as described under section 20.112(1) of the *Regulation*.

A qualified person is also required to fulfill duties in sections 20.112(7) and (8). The qualifications required of this person are described in section 1.1 of the *Regulation* as 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. This person may be a different person than the qualified person described in sections 20.112(2), (3), and (6). The qualified person fulfilling the duties of sections 20.112(7) and (8) would not perform asbestos surveys, and would not require a Level S certificate.

The following activities should also be conducted by a qualified person with education, training, and experience in the management and control of asbestos hazards:

- Collection and interpretation of air samples during asbestos abatement projects
- Preparation of inspection reports
- Conduction of workplace inspections

Inspection for and identification of any asbestos-containing materials
Section 20.112(2) of the *Regulation* requires that before work begins on the demolition or salvage of machinery, equipment, buildings, or structures, or the renovation of a building or structure, the employer or owner must ensure a qualified person inspects the site to identify any asbestos-containing materials. This inspection is separate from an inventory required by section 6.4 of the *Regulation*. The inventory prepared under section 6.4(1) is required for the protection of workers who may occupy a building. Although it may not include asbestos that wasn't readily accessible (e.g., hidden behind concrete walls or under a number of layers of flooring), the inventory required by section 6.4(1) will be a useful aid in conducting the inspection and identification of hazardous materials as specified in section 20.112(2). The purpose of the inspection required by section 20.112(2) is to locate and identify all asbestos-containing material prior to renovation, demolition, and salvage work.

The asbestos inspection process is referred to as a pre-renovation or pre-demolition *asbestos survey* and the person conducting the inspection is often referred to as the *surveyor* (section 20.112 refers to this person as a *qualified person*). Pursuant to section 6.2.1 of the *Regulation*, a surveyor must hold a valid asbestos Level S certificate. The asbestos survey includes a walk-through inspection, sample collection, sample analysis, reporting, and communication of the results. Surveyors must be familiar with proper walk-through and sample collection practices. There are a number of recognized industry standards which provide guidance on conducting asbestos surveys, and include the following:

- *The Ontario Regulation 278/05 Designated Substance – "Asbestos on Construction Projects and in Buildings and Repair Operations"*
- *Asbestos: The Survey Guide* (HSE – HSG264)
- EPA *How to Manage Asbestos in School Buildings EPA 910-B-96-001*
- *Managing Asbestos in Buildings: A Guide for Owners and Managers* (Environmental Information Association, 2015)

For detailed information on representative sampling for asbestos surveys, including a sample template of asbestos inspection reports, refer to the WorkSafeBC publication *Safe Work Practices for Handling Asbestos.*

Although this guideline is focused on asbestos, other hazardous materials must be inspected for and identified by the qualified person. Section 20.112(1) provides a definition of hazardous materials to mean a hazardous substance, or material containing a hazardous substance, including substances other than asbestos-containing materials, such as lead, heavy metals, or toxic, flammable, or explosive material.

Bulk asbestos sample collection
During the walk-through inspection the qualified person (a certified asbestos surveyor) identifies materials suspected to contain any asbestos. To confirm or discount the presence of asbestos, representative bulk samples must be collected. Multi-layered materials, like multiple layers of old tile and linoleum flooring or multiple layers in wall or ceiling materials, will commonly be encountered. Careful consideration must be given to which

layers of multi-layered materials to sample. Ideally a sample should be collected from each suspected layer. The qualified person should identify the sample location in the building with a unique sample number.

The sampling technique and quantity of material sampled are two other important factors to consider. Sufficient quantities of material must be collected. Check the laboratory method for required sample quantities or check with the laboratory analyst. For materials like loose vermiculite, the quantity collected is as required by the EPA/600/R-04/004 vermiculite sampling and analytical method. Sample collection methods must minimize disturbance and exposure to the persons collecting the bulk samples. Use of protective clothing and wearing of a properly fitted approved respirator is required. Persons collecting the samples must have a written sample collection procedure as part of their asbestos exposure control plan. (Refer to sections 6.3 and 5.54 of the *Regulation* for exposure control plan requirements.) A respiratory protection program is also required. (Refer to section 8.5 and sections 8.32 through 8.44 *Regulation* and the associated guidelines.)

The *Regulation* requires a qualified person to use their education, training, knowledge, and experience to determine which building materials should be sampled to identify hazardous materials as some building materials may not need to be sampled. Most asbestos-containing building materials were phased out by the early 1990s, meaning these materials are less likely to be found in newer buildings. However, hazardous materials specialists in B.C. have found asbestos in a few types of construction materials â€“ such as sealants, adhesives, mastics, caulking, and cement products â€“ in relatively new buildings (built as recently as 2018). It is also possible that asbestos-containing materials that pre-date 1990 may have been used after 1990.

A national report (Asbestos Management in Canada: Assessing the Need for a National Standard) references a misconception that there are no asbestos-containing materials in buildings built after 1990. In general, the more recently constructed the building is, the less likely it is to contain asbestos. The qualified person inspecting buildings to identify potential asbestos-containing materials may consider factors, such as the age of the building and recent renovations, in determining what materials to sample.

Sample analysis
Asbestos bulk samples should be analyzed by an accredited asbestos laboratory (if the laboratory is not accredited, it must be a participant in a quality control program). Methods accepted by WorkSafeBC for bulk sample analysis are specified in section 6.1 of the *Regulation*. These methods include requirements for laboratory equipment, calibration, quality control, and result reporting. Refer also to the online WorkSafeBC publication *Safe Work Practices for Asbestos Laboratories*.

Risk assessment for the abatement of identified asbestos
When the presence of asbestos is either confirmed through bulk sample analysis or a material is assumed to contain asbestos (e.g., asbestos furnace duct tape, asbestos cement transite board, or asbestos exterior shingles), a risk assessment must be performed before demolition, renovation, or salvage work begins to determine the exposure risk to workers and other persons. Refer to section 6.6 of the *Regulation* and OHS Guidelines G6.6-1 Risk Assessment to G6.6-2 Classification of risk.

Inspection reports must be "available at the worksite"
Commonly, the qualified person is hired and prepares the report for the owner. The information contained in the inspection report is used during the selection process for the licensed abatement contractor to scope out the work and during the planning of the work, highlighting one of the reasons why the accuracy of the report is critical.

As per section 20.112(4) of the *Regulation*, a copy of the inspection reports must be available at the worksite. The site documentation must include the inspection reports from the survey and any drawings, plans, or specifications that show the locations of any asbestos. This requirement applies to all employers who have workers on the demolition, salvage, or renovation worksite; including contractors where workers may disturb asbestos-containing materials by their work activities. Workers must have the information about the asbestos hazards on hand to use as a reference in planning their work and to avoid exposure to asbestos.

As per section 20.112(8) of the *Regulation*, having the inspection reports available at the worksite includes a written confirmation by the qualified person that the asbestos-containing materials specified for removal were safely contained or removed. A document such as a post-asbestos abatement inspection report, that confirms that an inspection was conducted to verify the safe removal of identified asbestos, is acceptable for this purpose. Refer to the Written Confirmation section of this guideline outlining the information that should be contained in a written confirmation by the qualified person.

Safe removal of asbestos
All asbestos specified for removal must be removed by a licensed asbestos abatement contractor and performed by certified workers using safe work practices and procedures before demolition occurs. The WorkSafeBC publication *Safe Work Practices for Handling Asbestos* and OHS Guideline G6.8 describe acceptable practices. Workers and other persons must not be exposed to asbestos during the demolition, renovation, or salvage of a building or structure. The asbestos removal practices and procedures must minimize the release of airborne asbestos fibres and must be in compliance with all applicable asbestos requirements in Part 6 of the *Regulation*.

Written confirmation
The employer must ensure that a qualified person has complied with the requirement to provide written confirmation that asbestos-containing materials have been safely contained or removed. The written confirmation is commonly referred to as the 'clearance' document or post-abatement inspection report. The qualified person, in this case, must be familiar with the work that was conducted and can be one of the following:

- Project consultant
- Prime contractor
- Licensed asbestos abatement contractor

- Demolition contractor
- Renovation contractor
- Certified asbestos surveyor

The written confirmation should include information such as the following:

- The date the clearance inspection was conducted
- The address of the abatement project
- The name of the abatement contractor
- A description of the scope of work that was performed
- The notice of project (NOP) number for the asbestos work, if applicable
- Waste manifest documentation
- Results of any air clearance sampling, and the name and signature of the surveyor, consultant, or contractor who collected the air samples
- Other relevant information, such as a reference to the hazardous materials inspection report, the name of the consultant, surveyor, or contractor who performed the final visual inspection
- A statement indicating that the abatement was conducted in accordance with regulatory requirements, and that the asbestos was safely removed

Asbestos encountered during demolition, renovation, or salvage work
Sections 20.112(6) and (7) of the *Regulation* describe requirements when hazardous material not previously determined to be hazardous is discovered. If any suspected asbestos material is encountered during demolition, renovation, or salvage work, such as in walls or some other concealed space or location that was missed during the pre-abatement inspection process, work must cease until the actions required by this section are completed (i.e., sample collection and identification, determination of the locations of the materials, and subsequent implementation of the required control measures — usually removal of the asbestos). This means that the demolition, renovation, or salvage work, workers need some basic awareness and skill in recognition of materials likely to contain asbestos. Having the ability to recognize building materials and products that may contain asbestos is part of the training and instruction that demolition, renovation, and salvage work employers need to provide to their workers who may be exposed to asbestos (refer to section 6.11 of the *Regulation* for asbestos training requirements).

Other requirements
The *BC Building Code* and various municipal bylaws also have requirements regarding demolition procedures. The owner or employer should check with the appropriate local authority for further details.

10 Steps to Compliance with Asbestos Abatement Requirements

Most asbestos-containing materials were phased out by the early 1990s. However, asbestos has been found in a few types of construction materials in relatively new buildings (as recently as 2018). The qualified person must use their education, training, and experience to determine a sampling strategy.

(1) A home or building is to be demolished, renovated, or salvaged.

↓

(2) The building owner (or owner's representative) and the employer (e.g., builder, demolition contractor) retains a qualified person (a certified asbestos surveyor) to perform a risk assessment and asbestos survey before conducting work where asbestos may be disturbed.

↓

(3) The qualified person inspects the home or building, collects representative bulk samples, and has the samples analyzed by a qualified laboratory.

↓

(4) The qualified person prepares a report that identifies all inspection results (including drawings, plans, or specifications), the results of the risk assessment, and the scope of work for abatement of the asbestos.

↓

(5) The report containing the inspection results is provided to the owner or employer. The inspection results must be available at the worksite.

↓

(6) The owner or employer retains a licensed asbestos abatement contractor with certified workers. A Notice of Project (NOP) form with written work procedures is submitted to WorkSafeBC 48 hours before asbestos removal work begins.

↓

(7) Safe removal and disposal of identified asbestos occurs.

↓

(8) After the asbestos removal, the owner or employer receives written confirmation that the asbestos specified for removal on the NOP has been safely removed. A copy of the inspection report is available on site.

↓

(9) The owner authorizes demolition, renovation, or salvage work on the home or building to proceed. The contractor proceeds with the work using safe work procedures. Copies of inspection results and post-abatement reports are available on site.

↓

(10) If any material suspected to be asbestos is found during demolition, renovation, or salvage work, all work is to cease. Go back to step 2 and retain a qualified person so that, if confirmed to be asbestos, the material is safely contained or removed by following steps 2-8.

G20.123 Alternate acceptable standard

Issued February 11, 2021

Regulatory excerpt

Section 20.123 of the OHS Regulation ("*Regulation*") states:

> 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*.

Section 4.4(2)(a) of the *Regulation* states:

> (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 …

Purpose of guideline

Section 4.4(2)(a) of the *Regulation* provides WorkSafeBC the authority to accept alternative standards to those listed in the *Regulation*. The purpose of this guideline is to specify the 2009 version of CSA Z275.3 as an acceptable alternative standard under section 20.123.

Alternative standard

The *CSA Standard CAN/CSA Z275.3-09, Occupational safety code for work in compressed air environments* is accepted as an alternative standard.