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## PART 10 – CONSTRUCTION AND BUILDING SAFETY

### DEFINITIONS

**10.01** In this part, the following definitions apply:

“adjacent to an excavation”

means within a distance less than or equal to the overall depth of the excavation, measured from a vertical line through the toe of the excavation face;

“demolition”

means tearing down, destruction, break-up, razing or removal of the whole or part of a building or structure, or of free-standing machinery or equipment that is directly related to the function of the structure;

“excavation”

means any cut, cavity, trench or depression in the earth’s surface resulting from rock or soil removal;

“formwork”

includes the foundation, supporting structure and mould into which concrete will be placed;

“tilt-up construction”

means a system of building construction in which concrete wall panels are placed in position in the permanent structure and temporarily braced or supported;

“trench”

means an excavation less than 3.7 m (12 ft.) wide at the bottom, over 1.2 m (4 ft.) deep, and of any length.

**NOTE** The “principal contractor” as referred to in the *Occupational Health and Safety Act* is generally considered to be the “constructor” as defined in the *Act*.

### GENERAL

#### Duties

**10.02** The constructor or owner of a project shall ensure that where a project involves the work of two or more employers or their workers

- (a) all employers and workers shall comply with the requirements of the *Occupational Health and Safety Regulations*,
- (b) a competent person shall be designated as site coordinator and coordinate the health and safety activities and programs at the site by
  - i. informing the employers and workers of the hazards created and present,
  - ii. ensuring the hazards are addressed appropriately, and
  - iii. keeping readily available on site an updated copy of construction safety procedures and drawings showing the first aid station, emergency transportation provisions and evacuation marshalling station,
- (c) all employers and workers involved shall be informed of their responsibilities and duties with respect to health and safety, and
- (d) the owner, constructor and project manager shall be informed in advance of any undertaking likely to create a hazard for a worker of another employer.

## FORMWORK AND SHORING

- Specifications**      **10.03** When formwork or shoring is erected more than 3 m (10 ft.) above ground level
- Design**
- (1) All formwork and shoring shall be designed by a professional engineer and erected in accordance with the design drawings and specifications prepared by the engineer, following the requirements of
    - (a) *CSA Standard S269.1-1975, Falsework for Construction Purposes,*
    - (b) *CSA Standard S269.3-M92, Concrete Formwork,* or
    - (c) other similar standards acceptable to the director.
  - (2) The drawings referred to in subsection (1) for the formwork and shoring shall
    - (a) identify the components if manufactured formwork and shoring is used,
    - (b) show the size, grade and specifications of materials to be used if the formwork and shoring is to be constructed on the project site,
    - (c) show the design and working loads for the formwork and shoring with the detail on bracing and external ties required to adequately support the loads,
    - (d) show the attachment points for rigging and hoisting if the formwork and shoring are to be moved as a unit,
    - (e) set out the erection instructions specified by the manufacturer or the professional engineer,
    - (f) indicate the method, sequence and rate of pouring concrete,
    - (g) bear the signature of the professional engineer,
    - (h) be kept on the project site, and
    - (i) be made available to a safety officer on request.
- Loading requirements**
- (3) The formwork and shoring shall be erected, supported and braced so that it is capable of withstanding all loads and forces likely to be applied to it
    - (a) without exceeding the allowable working loads established for any component of the structure, and
    - (b) without causing uplifting, sliding, overturning or lateral displacement of the shoring or formwork system.
- Load capacity**
- (4) Workers delivering materials to or working on a temporary floor, decking, floor opening, covering or formwork shall be informed of the safe carrying capacity of the surface and the precautions required to prevent overloading.
- Inspections**
- (5) The formwork and shoring shall
    - (a) be inspected by a professional engineer or another competent person designated by the employer, and
    - (b) not be removed before the concrete is poured until
      - i. the concrete is strong enough to support itself and any loads that may be applied to it, or
      - ii. the concrete is adequately reshored.
  - (6) A professional engineer or a designate shall authorize the pour in writing.
- Supports / braces**      **10.04** Where formwork and shoring is used less than 3 m (10 ft.) above ground level, it shall be erected, supported and braced so that it is capable of withstanding all loads and forces likely to be applied to it.

## STRUCTURAL FRAMEWORK

- Certified drawings**      **10.05** (1) Where structural framework is being erected using structural steel or precast concrete, the drawings and procedures for the erection shall be prepared and certified by a professional engineer.

- Modifications** (2) A professional engineer shall certify any modifications of procedures referred to in subsection (1).
- Instruction to workers** (3) The workers engaged in the erection of the structural framework shall be instructed in the procedures referred to in subsections (1) and (2).
- On-site drawings** (4) The drawings and procedures referred to in subsections (1) and (2) shall be
  - (a) kept on the project site, and
  - (b) made available to a safety officer on request.
- Workers in area** (5) Workers not engaged in the erection of the structural framework shall remain clear of the immediate work area until the structural framework is stabilized.

### BUILDING STRUCTURES

- Design** **10.06** (1) Every part of a building, project or a temporary structure shall
  - (a) meet the applicable requirements and specifications of the *National Building Code of Canada*,
  - (b) be designed and constructed to support or successfully resist all forces and loads to which it may be subjected without exceeding the allowable unit stress for each material or component,
  - (c) have a professional engineer's certification available to support the requirement that the load on any component or member of the building or structure, including the floor, roof or any other part, does not exceed the allowable unit stresses, and
- Bracing** (d) be adequately braced to prevent any movement that may affect its stability or cause its failure or collapse.
- Column connection** (2) Every part of a building, project or temporary structure that has two or more structural steel columns or beams connected to a common column or beam shall have
  - (a) the connection made using a clipped double connection, or
  - (b) the first column or beam secured in a seated connection.
- Loading** (3) Every part of a building, project or temporary structure shall have none of its components or members subjected to loads or stresses in excess of their individual designed and constructed capability.
- Support** **10.07** Where a building or structure is being constructed
  - (a) work shall be completed on any component designed to support or give added support to a part of the building or structure before proceeding with any other work that adds to the load on that part,
- Masonry walls** (b) a free-standing wall of brick, concrete blocks or similar materials shall be braced from both sides until the wall is attached to a rigid structure and the mortar has set adequately,
- Bracing** (c) a free-standing wall or structure designed to support roof components or any load shall be braced from both sides until the free-standing wall or structure is stabilized,
- Guardrails** (d) a guardrail, as required by Part 1 – General, shall be installed at the perimeter of each floor when erecting a framework or structure in advance of the outer walls,
- Bracing removal** (e) the bracing or shoring shall be retained on all floor levels beneath the floor where concrete is being poured until the removal is authorized by a professional engineer, and
- Certified bracing** (f) certification by a professional engineer stating that the forms, bracing, shoring and supports for concrete will safely support the intended load shall be available if requested by a safety officer.

- Wooden trusses**      **10.08** (1) Wooden trusses shall be erected in accordance with the manufacturer's specifications.
- (2) The manufacturer's specifications shall be kept readily available on the project site.
- Closing in**      **10.09** (1) During the construction of a building or structure, each floor level in the building or structure shall be closed in, except for necessary openings, before the floor above is started.
- Temporary floors**      (2) A temporary working floor shall
- (a) support a minimum live load of 2.4 kPa (50 lb. per sq. ft.),
- (b) be strengthened as a load is added to it,
- (c) have planks that are securely fastened and supported on each end 0.3 m (12 in.) beyond the opening that is being covered, and
- (d) have no unsupported projection of a length that would be unstable if a worker were to stand on it or that exceeds 0.45 m (18 in.), whichever is the lesser.
- Safety precautions**      (3) Where it is not practicable to install a temporary working floor
- (a) a safety net shall be installed under the area where a worker is working, or
- (b) each worker shall use an individual fall-arresting system.

## ROOFING

- Ladders and crawl boards**      **10.10** (1) Crawl boards or ladders used for roof work shall be securely fastened over the ridge of the roof or otherwise effectively anchored.
- (2) Eavestroughs shall not be used as a support for any purpose.
- Working platforms**      (3) When working on fragile roofing material incapable of supporting workers, safe access and safe working platforms shall be provided by means of catwalks and decking spanning the roof framing.
- Notice**      (4) Where subsection (3) applies, a notice stating "FRAGILE ROOF: NO ACCESS WITHOUT PROPER EQUIPMENT" shall be displayed at all access points to the roof incapable of supporting workers.
- Fall protection**      **10.11** A worker shall be protected by the use of a fall restraint system, a fall arrest system, a control zone, or another system of fall protection acceptable to the director when a worker is engaged in any work on a roof that
- (a) is 3 m (10 ft.) or more above the ground or other safe working level,
- (b) has a slope of 2 vertical to 3 horizontal or steeper, or
- (c) has an unguarded edge.
- Guardrails**      **10.12** A guardrail shall be provided on a roof edge where
- (a) a pipe discharges hot tar or bitumen within 2 m (6 ft.) of the edge of the roof,
- (b) any hoist discharges material onto the roof or has material placed on it, within 2 m (6 ft.) of the edge of the roof, or
- (c) any chute or decline has material placed on it within 2 m (6 ft.) of the edge of the roof.
- Fall arrest**      **10.13** (1) Where a fall arrest system is used, it shall conform to the requirements of Part 1 – General.
- Fall restraint**      (2) Where a fall restraint system is used, it shall be
- (a) rigged to allow the movement of workers only as far as the edge of the roof, and

(b) attached to a secure anchor capable of supporting the loads that may be applied to it.

(3) Any fall restraint system shall be installed and used in conformance with *CSA Standard Z259.1-05, Body Belts and Saddles for Work Positioning and Travel Restraint*, or other similar standard acceptable to the director.

**Control zone requirements**

**10.14** Where a control zone system is used where work is being done at a place where a fall of 3 m (10 ft.) or more may occur, and the use of a fall arrest or fall restraint system is not practicable or may result in an additional hazard, the system shall meet the following requirements:

- (a) a control zone system shall not be used on a roof with a slope of more than 4 vertical to 12 horizontal,
- (b) the control zone shall be at least 2 m (6 ft.) in width, with additional distance added when
  - i. the working surface is slippery or sloped,
  - ii. the work is being conducted on an elevation above the unguarded edge, or
  - iii. the risk is increased by the use of equipment near the control zone,
- (c) where the work will be done within 2 m (6 ft.) of the control zone, a line defining the control zone shall be made clear by raising the warning line or by another equally effective means,
- (d) a raised warning line marking the edge of a control zone shall be
  - i. a line of high-visibility material or a line flagged or clearly marked with high-visibility material, placed less than 2 m (6 ft.) apart, and
  - ii. rigged and maintained to be between 0.85 m and 1.15 m (34 in. and 45 in.) above the working surface,
- (e) where work is being done between the unguarded edge and the control zone, a safety monitor shall be appointed to ensure the work is carried out safely or the workers must wear fall protection,
- (f) the safety monitor shall
  - i. be a qualified person, trained in the role and duties of a safety monitor,
  - ii. be present whenever a worker is inside the control zone,
  - iii. have authority over the work as it relates to fall protection,
  - iv. only engage in the duties of a safety monitor,
  - v. be positioned at or near the work,
  - vi. be easily distinguishable from the other workers, and
  - vii. have responsibility for a maximum of eight workers,
- (g) the only workers allowed inside the control zone shall be those directly involved in the work, and
- (h) where workers will not be inside the control zone, no other fall protection system shall be required.

**Roofer's hoist requirements**

- 10.15**
- (1) A hoist used to raise materials to a roof shall be
    - (a) capable of performing the tasks, and
    - (b) equipped with suitable ropes, chains, slings, hooks and other fittings, so as to ensure the safety of the worker who uses the hoist or works in its vicinity.
  - (2) The weights used to counterbalance a roofer's hoist shall be
    - (a) adequate for the equipment used and the weight being hoisted,
    - (b) secured to the hoist to prevent their premature removal, and
    - (c) those recommended by the hoist manufacturer.
  - (3) Guardrails, or a safety fence manufactured as part of a hoist, shall be installed in perimeter travel areas on a roof near the hoist areas and the dumping areas.

- Roofing brackets**      **10.16** Roofing brackets shall be
- (a) constructed to withstand any anticipated load and maintained in good condition,
  - (b) installed by securely nailing them to the roof and provided with effective non-slip devices, and
  - (c) not used on a roof steeper than two-third pitch, (a slope ratio of 0.2 m (8 in.) vertical to 0.3 m (12 in.) horizontal).

**HOT TAR OR BITUMEN ROAD TANKERS**

- Operator**      **10.17** (1) Only a qualified person shall operate a hot tar or bitumen road tanker or kettle.
- Propane fuelled**      (2) Where a road tanker or kettle is fitted with a propane fuelled heater
- (a) the storage cylinder for propane shall be placed more than 3 m (10 ft.) from a source of fire or ignition,
  - (b) the lines connecting the propane storage cylinder to the heating device shall be well protected against contact with the hot tar or bitumen in the event of spill or failure of a component of the system,
  - (c) a fire extinguisher shall have a rating of at least 4A40BC established by the Underwriters' Laboratories of Canada,
  - (d) the propane burner used in the road tanker or kettle shall have a thermal rating no greater than that recommended by the manufacturer of the road tanker or kettle,
  - (e) the propane supply line shall have a pressure regulator at the cylinder,
  - (f) the hot tar or bitumen shall be transferred from a road tanker to a kettle through enclosed pipe, and
  - (g) the pipe supplying tar or bitumen to the roof shall be securely fixed and supported to prevent deflection.

**WALKING STILTS**

- 10.18** A worker shall only use metal walking stilts and the stilts shall
- (a) be 0.76 m (30 in.) or less in height,
  - (b) be used on surfaces that are clean, level and free from tripping or slipping hazards, and
  - (c) not be used to climb stairs, work on scaffolds or work beyond the confines of any building or structure.
- Height**
- Surface**
- Walking area**

**STAIRWAYS**

- 10.19** Stairways shall
- (a) be of sufficient strength to sustain a live load of 4.8 kPa (100 lbs. per sq. ft.),
  - (b) be a minimum width of
    - i. 0.9 m (36 in.) for an interior stairway, or
    - ii. 1.1 m (42 in.) for an exit stairway,
  - (c) be pitched not less than 20 degrees and not more than 35 degrees from the horizontal,
  - (d) have risers constant in height, not less than 0.125 m (5 in.) and not more than 0.2 m (8 in.),
  - (e) have treads constant in width and not less than 0.23 m (9 in.) in width,
  - (f) have a maximum height of 3.7 m (12 ft.) between landings,
  - (g) have a vertical clearance of 2.2 m (7 ft.) from the top of the tread at all points in the stairway,
- Load**
- Width**
- Pitch**
- Risers**
- Treads**
- Height**
- Clearance**

- Non-slip** (h) have a non-slip nosing or a strip of non-slip material not less than 0.05 m (2 in.) in width and installed 0.025 m (1 in.) from the front edge of the tread on all treads where there may be a hazard of slipping due to the material of the tread, and
- Perforated tracks** (i) when treads or landings are made from perforated material, not have openings larger than 0.012 m ( $1/2$  in.).
- Temporary stairs on a project** **10.20** On a project where work on a building or structure progresses to one storey or 4.5 m (15 ft.) above the lowest floor level, whichever is the lower
  - (a) permanent stairs or temporary stairs complete with handrails shall be installed in the building or structure leading from the lowest floor level to all the floors above, and
  - (b) a skeleton steel stairway with treads that are not completed during the construction stages shall have temporary wooden treads set into the full length and width of the steps and landings.

#### LADDERS – GENERAL

- General requirements** **10.21** Any ladder shall be
  - (a) of adequate strength and length for the work being done,
  - (b) clean and free from grease, oil or other slippery substance,
  - (c) maintained in safe condition, and
  - (d) removed from service or repaired immediately when it has loose, broken or missing rungs, split side rails or other defects that may be hazardous to a worker.

#### LADDERS – FIXED

- Standards** **10.22** (1) Except for the provisions in subsection (2), fixed ladders shall meet the requirements of *ANSI Standard A14.3-2002, Ladders – Fixed – Safety Requirements*, or other similar standard acceptable to the director.
  - (2) A fixed ladder existing prior to the effective date of these Regulations and not meeting the requirements of the current or earlier edition of the *ANSI Standard A14.3-2002, Ladders – Fixed – Safety Requirements*, or other similar standard acceptable to the director, shall be inspected by a competent person to ensure it meets the requirements of subsection (1).
- Secured** **10.23** A fixed ladder shall
  - (a) be securely held in place at the top and bottom and at such intermediate points as required to prevent sway,
  - (b) have a clearance of at least 0.165 m (6 in.) maintained between the rungs and the structure to which the ladder is affixed,
  - (c) not have any rungs that extend above a landing, and
  - (d) have side rails or other secure handholds that extend at least 1 m (3 ft.) above the landing and spaced not less than 0.3 m (12 in.) apart.
- Clearance**
- Landings**
- Side rails**
- Ladder cages** **10.24** A fixed ladder more than 5 m (16 ft.) in height shall
  - (a) be equipped with ladder cages or a safety device that is designed and constructed to lock and to suspend a worker using the device if the worker loses hold of the ladder,
  - (b) have a rest platform at not more than 9 m (30 ft.) intervals, and be offset at each rest platform, and
  - (c) when fitted with a ladder cage, the cage shall
    - i. be provided with metal hoops spaced to prevent a worker from falling
- Rest platform**
- Cage requirements**



- away from the ladder and to contain a worker who may lean or fall against the cage,
- ii. extend 0.68 m to 0.76 m (27 in. to 30 in.) from the centreline of the rungs of the ladder,
- iii. extend from a point 2.5 m (8 ft.) from the base of the ladder to the top of the ladder, and
- iv. be free of projections on the inside.

#### LADDERS – PORTABLE

<b>Standards</b>	<b>10.25</b>	(1) The design, construction and use of portable ladders shall meet the requirements of <ul style="list-style-type: none"> <li>(a) <i>CSA Standard Z11-M81, Portable Ladders</i></li> <li>(b) <i>ANSI Standard A14.1-2000, Safety Requirements for Ladders – Portable Wood,</i></li> <li>(c) <i>ANSI Standard A14.2-2000, Safety Requirements for Portable Metal Ladders,</i> or</li> <li>(d) other similar standards acceptable to the director.</li> </ul>
<b>Grade Markings</b>	<b>(2)</b>	Manufactured portable ladders shall be marked for grade and use and used in accordance with the manufacturer's instructions.
<b>Maximum length</b>	<b>10.26</b>	The maximum length of a portable ladder, measured along the side rail, shall not be more than <ul style="list-style-type: none"> <li>(a) 5 m (16 ft.) for a trestle ladder or for each of the base or extension sections of an extension trestle ladder,</li> <li>(b) 6 m (20 ft.) for a stepladder,</li> <li>(c) 9 m (30 ft.) for a single ladder or an individual section of a ladder,</li> <li>(d) 15 m (49 ft.) for an extension ladder having two sections, and</li> <li>(e) 20 m (66 ft.) for an extension ladder having more than two sections.</li> </ul>
<b>General Lumber grade Coatings</b>	<b>10.27</b>	A portable wooden ladder used at a workplace shall <ul style="list-style-type: none"> <li>(a) be made of No. 1 structural grade or better spruce or fir,</li> <li>(b) not be painted other than by being preserved with a transparent protective coating, except for identification markings, which are painted on one side of each side rail, to a maximum of one third of the area of the side rail,</li> </ul>
<b>Length Rungs</b>	<b>(c)</b>	not exceed 6 m (20 ft.) in length,
<b>(d)</b>	<b>have rungs</b>	<ul style="list-style-type: none"> <li>i. free of knots,</li> <li>ii. designed to carry a load of 200 kg (440 lbs.) placed at the centre,</li> <li>iii. uniformly spaced with a maximum rise of 0.3 m (12 in.),</li> <li>iv. secured to each side of the side rail of the ladder by at least three screws or barbed nails of adequate length or by attachments giving equivalent or better strength, and</li> <li>v. with filler blocks installed between the rungs, and</li> </ul>
<b>Side rails</b>	<b>(e)</b>	have side rails <ul style="list-style-type: none"> <li>i. dressed on all sides and without sharp edges,</li> <li>ii. with a uniform clear width between them of not less than 0.3 m (12 in.) for ladders 3 m (10 ft.) in length or less, and increasing 0.013 m (1/2 in.) in width for each 0.3 m (12 in.) in excess of 3 m (10 ft.), and</li> <li>iii. that are free of notches, splices and tapers.</li> </ul>
<b>Portable extension ladders</b>	<b>10.28</b>	A portable extension ladder shall <ul style="list-style-type: none"> <li>(a) have no more than three sections,</li> <li>(b) have locks that securely hold the sections of the ladder in an extended position, and</li> </ul>

- (c) when extended, shall maintain a minimum overlap as follows
  - i. where the ladder is 11 m (36 ft.) or less, the overlap is at least 1 m (3 ft.),
  - ii. where the ladder exceeds 11 m (36 ft.) and is less than 15 m (49 ft.), the overlap is at least 1.25 m (4 ft.), and
  - iii. where the ladder exceeds 15 m (49 ft.) and is less than 20 m (66 ft.), the overlap is at least 1.5 m (5 ft.).

**Worker's responsibilities**  
**Inspection**  
**Unsafe Climbing**

- 10.29** The worker who uses a portable ladder shall ensure that
- (a) the ladder is appropriate for the task being performed,
  - (b) the ladder is inspected before use,
  - (c) any unsafe condition of the ladder is reported to the employer,
  - (d) the ladder is faced and both hands used when climbing or descending,
  - (e) when standing on a ladder, he or she stands in the centre between the side rails,
  - (f) the side rails of the ladder extend at least 1 m (3 ft.) above any platform or landing to which the ladder is a means of access,
  - (g) where extended to a height of more than 3 m (10 ft.), it is effectively secured or held in place by another worker,
  - (h) if it is a stepladder, the legs are securely held in position by means of metal braces or an equivalent rigid support,
  - (i) a stepladder is used only when the front section has a maximum pitch of one in six in the open position,
  - (j) when used as a self supporting unit, the legs of a stepladder are fully spread and the spreader is locked,
  - (k) he or she does not work or stand on the top
    - i. two rungs of a stepladder, except in cases where the stepladder is equipped with a railed platform, and
    - ii. three rungs of a portable single or extension ladder,
  - (l) ladders are not spliced together unless the spliced section is braced so that the spliced side rails are as strong as the original side rails,
  - (m) a ladder is not placed in front of or against a door unless the door is blocked in the open position, locked or guarded,
  - (n) a ladder is not used as scaffold flooring or as support for scaffold flooring,
  - (o) ladders made of metal or electrically conductive material are not used when working within 3 m (10 ft.) of energized electrical lines, and
  - (p) if the ladder is not securely fastened, it is placed so that the base of the ladder is not less than one-quarter and not more than one-third of the length of the ladder from a point directly below the top of the ladder and at the same level as the base of the ladder.

**Beyond landing**

**Secured**

**Stepladder**

**Splicing**

**Use**

**Near electricity**

**Angle**

**WORK PLATFORMS**

**Lumber**

- 10.30** (1) All wood used in a work platform shall be No. 1 structural grade or better spruce, fir or equivalent wood, and not be painted other than by being preserved with a transparent protective coating.

**Guardrails**  
**Loading**

- 10.31** With the exception of an elevating work platform, scaffold, suspended work platform, swing staging or a boatswains chair, a work platform
- (a) that is elevated more than 1.2 m (4 ft.) in height shall have guardrails,
  - (b) shall be designed, constructed and maintained to support, without exceeding the allowable unit stresses for the materials used, all loads that may be expected to be applied to it, and support not less than 1.4 kPa (30 lbs. per sq. ft.),

**Width**

- (c) shall be 0.5 m (20 in.) or more in width, and

- Secure** (d) shall be securely fastened in place.
- Elevated and self-propelled platforms Standards** **10.32** An elevating work platform shall be designed, constructed, erected, maintained, inspected, monitored and used in accordance with the following standards:
- (a) *CSA B354.1-M82, Elevating Rolling Work Platforms,*
  - (b) *CSA B354.2-M82, Self-Propelled Elevating Work Platforms for Use on Paved/Slab Surfaces,*
  - (c) *CSA B354.3-M82, Self-Propelled Elevating Work Platforms for Use as 'Off-Slab' Units,*
  - (d) *CSA B354.4-M82, Boom-Type Elevating Work Platforms, or*
  - (e) other similar standards acceptable to the director.

### SCAFFOLDS – GENERAL

- Standards** **10.33** Scaffolds shall meet the requirements of the following applicable standards
- (a) *CSA S269.2-M87, Access Scaffolding for Construction Purposes,*
  - (b) *ANSI/ASSE A10.8-2001, Scaffolding Safety Requirements,*
  - (c) *ANSI A14.7-2000, Safety Requirements for Mobile Ladder Stands and Mobile Ladder Stand Platforms,*
  - (d) *CSA Z271-98, Safety Code for Suspended Elevating Platforms,*
  - (e) the written and certified requirements of a professional engineer, or
  - (f) other similar standards acceptable to the director.
- Engineered** **10.34** A scaffold of a type not otherwise referred to in these Regulations shall be designed by a professional engineer and the scaffold shall be constructed and used in accordance with the drawings and specifications, which shall be made available to a worker or safety officer on request.
- General Condition Erection Daily inspection Components** **10.35** Scaffolds shall
- (a) be in safe condition regardless of who erected the scaffolds,
  - (b) be erected, altered or dismantled only by qualified persons,
  - (c) be inspected daily before use and after any modification,
  - (d) not be used if damaged until the scaffold component has been repaired,
  - (e) have each major component of a manufactured scaffold clearly marked to identify the manufacturer,
  - (f) have a copy of the manufacturer's technical data for scaffold components in use kept available at the workplace for reference,
  - (g) only be used in accordance with written instructions from a professional engineer if the components cannot be identified or the related technical data are not available,
  - (h) if constructed from lumber, be constructed from unpainted, construction grade, dressed or better lumber,
  - (i) if light-duty, designed to carry an evenly distributed maximum load of 1.2 kPa (25 lbs. per sq. ft.) and be used only to carry workers, and
  - (j) if heavy-duty, be designed to carry a maximum load of 3.5 kPa (75 lbs. per sq. ft.), which enables them to be used for both the material and workers.
- Lumber**
- Light-duty**
- Heavy-duty**
- 10.36** A scaffold shall
- (a) be erected plumb and level,
  - (b) have vertical supports, legs or uprights resting upon a firm foundation or sills of appropriate size,
  - (c) be secured by one tie for each 4.5 m (15 ft.) vertical interval and one tie for each 6 m (20 ft.) horizontal interval,
- Level**
- Footings**
- Tie-ins**

<b>Minimum platform width</b>	(d) have a platform that is at least 0.5 m (20 in.) wide, and (e) have maximum spacing between vertical supports and bearers of i. 3 m (10 ft.) for light-duty scaffolds, and ii. 2.1 m (7 ft.) for heavy-duty scaffolds.
<b>Access</b>	<b>10.37</b> (1) A safe means of access shall be provided to all working levels of a scaffold.
<b>Climbing</b>	(2) Cross-bracing or diagonal bracing shall not be used to climb a scaffold.
<b>Materials and tools</b>	(3) Only materials for current use shall be kept on the scaffold.
<b>Moving scaffold</b>	(4) The scaffold shall not be moved with workers or unsecured tools, materials or equipment on the scaffold.
<b>Removing braces</b>	(5) A diagonal supporting brace shall only be removed at the working face level for access, and only if precautions are taken to ensure that the strength of the scaffold is not otherwise weakened and the brace is replaced immediately after the work is completed.
<b>Protection of workers below</b>	(6) A worker on a scaffold, above another worker, shall ensure that the worker below is protected from objects falling from the higher level by overhead protection or by such means as tying off tools and other unsecured objects.

#### SCAFFOLD PLANKS

<b>Lumber grades</b>	<b>10.38</b> Except as provided in specific sections within this part, solid wood scaffold planks used for work platforms more than 1.8 m (6 ft.) long shall be (a) graded "Select Structural – Scaffold Plank" or "Select Structural – Joists and Planks" not less than 0.038 m x 0.235 m (2 in. x 10 in. nominal), or (b) graded "Number 2 and Better – Joists and Planks" not less than 0.048 m x 0.251 m (2 in. x 10 in. rough sawn), or (c) graded "Number 2 and Better – Joists and Planks" not less than 0.038 m x 0.235 m (2 in. x 10 in. nominal), provided the planks are doubled up, one on top of the other, and
<b>Lumber quality</b>	(d) hand picked for minimal knots, straight grain, and free of other defects.
<b>Plank width</b>	<b>10.39</b> Solid wood planks on a scaffold platform shall (a) be laid side by side to produce a work platform of at least two nominal 0.03 m x 0.235 m (2 in. x 10 in.) planks wide, (b) have a span not longer than 3 m (10 ft.), (c) extend at least 0.15 m (6 in.) and not more than 0.3 m (12 in.) beyond a bearer, (d) be laid flat with an overlap of at least 0.3 m (12 in.) with another plank, with the centre of the overlap directly over a bearer, and (e) be secured to prevent movement in any direction.
<b>Span</b>	
<b>Overlap supports</b>	
<b>Overlap planks</b>	
<b>Secure</b>	

#### SCAFFOLDS – METAL FRAME

<b>Erection</b>	<b>10.40</b> A fabricated metal scaffold system shall (a) be erected, used, maintained and dismantled in accordance with the manufacturer's specifications, (b) be equipped with continuous access ladders or stairways, (c) be regularly inspected for any damage, deterioration or loosening of the connections of its structural members that may affect its strength and if such damage, deterioration or loosening is found, the scaffold shall be removed from use until repaired,
<b>Ladders</b>	
<b>Inspection</b>	

- Bracing**
  - (d) be supported by cross-bracing and diagonal bracing at each level as the erection of the scaffold progresses,
  - (e) have the necessary cross-bracing and diagonal bracing in place before any worker is allowed to work on it, except to erect the scaffold, and
- Parts secured**
  - (f) have all the parts securely fastened together.

#### **SCAFFOLDS – LADDER-JACK**

- 10.41** A ladder-jack scaffold shall
- Light-duty**
    - (a) be used only as a light duty scaffold,
  - Height**
    - (b) be not more than 3 m (10 ft.) in height, unless each worker uses a personal fall arrest system, secured to independent anchors,
  - Ladders secure**
    - (c) have supporting ladders properly secured against displacement,
  - Ladder type**
    - (d) have only heavy duty ladders used as uprights,
  - Use**
    - (e) be used only for operations where the work period between changes of scaffold position is of short duration,
  - Two workers**
    - (f) not have more than two workers on it at any one time,
  - Attachments**
    - (g) have the ladder-jack assembly securely fastened to the ladder so that it bears on the side rails, and
  - Width**
    - (h) have a platform that is a minimum of
      - i. 0.038 m x 0.285 m (2 in. x 12 in.) in dimensions and supported at intervals not exceeding 3 m (10 ft.) for a solid wood plank, and
      - ii. 0.3 m (12 in.) in width, supported at intervals not exceeding 7.2 m (24 ft.) if a manufactured staging is used.

#### **SCAFFOLDS – PUMP-JACK**

- 10.42** A pump-jack scaffold shall
- Light-duty**
    - (a) be used only as a light duty scaffold,
  - Erection**
    - (b) be erected, maintained and used in strict conformance with the manufacturer's instructions,
  - Poles**
    - (c) be erected only with manufactured metal poles or synthetic poles with a wood face, or other materials certified by the manufacturer, and
  - Documents**
    - (d) have manufacturer's documentation with it on site to indicate proper erection and use.

#### **SCAFFOLDS – HALF-HORSE**

- 10.43** Half-horse scaffolds shall
- Light-duty**
    - (a) be used only as light duty scaffolds,
  - Bearers**
    - (b) have bearers not more than 3 m (10 ft.) apart,
    - (c) have blocking on the wall to support the end of the bearer at the wall
  - Height**
    - (d) be 5 m (16 ft.) or less in height,
  - Access**
    - (e) have ladders to provide access to and egress from to the work platform,
  - Uprights**
    - (f) not have spliced uprights, and
  - Dimensions**
    - (g) have dimensions as shown in Tables 10-1 and 10-2 as applicable.

Table 10-1 Half-Horse Scaffolds Up to 3 m (10 ft.)		
	Metric	Imperial
Bearer	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Ledger	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Legs	0.038 m x 0.089 m	2 in. x 4 in. (nominal)
Braces	0.019 m x 0.184 m	1 in. x 8 in. (nominal)
Ribbons	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Leg spread, bottom	0.90 m	3 ft.

Table 10-2 Half-Horse Scaffolds 3 to 5 m (10 to 16 ft.)		
	Metric	Imperial
Bearer	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Ledger	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Legs	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Braces	0.019 m x 0.184 m	1 in. x 8 in. (nominal)
Ribbons	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Leg spread, bottom	1.5 m	5 ft.

#### SCAFFOLDS – BRACKET

##### 10.44 Bracket scaffolds shall

**Lumber**

**Metal  
Spacing**

**Attachment**

**Light-duty  
Height**

- (a) have brackets,
  - i. made in a triangle of at least 0.038 m x 0.089 m (2 in. x 4 in. nominal) lumber of construction grade or better, or
  - ii. made of metal of equivalent strength of the wooden brackets, and
  - iii. spaced not more than 3 m (10 ft.) apart,
- (b) have brackets attached to the wall by
  - i. bolting through the wall and through a 0.038 m x 0.089 m (2 in. x 4 in. nominal) cleat that spans at least two studs,
  - ii. hooking over a well secured supporting member of adequate strength,
  - iii. bolting, welding or hooking over a well secured supporting member of adequate strength where metal brackets are used, or
  - iv. other means, designed and certified by a professional engineer,
- (c) be used only as light-duty scaffolds, and
- (d) not be used at a height of more than 5 m (16 ft.) above ground level or other working surface unless specifically designed and certified by a professional engineer.

#### SCAFFOLDS – SINGLE-POLE, DOUBLE-POLE

**Light-duty**

**Single-pole  
dimensions**

- 10.45 (1) Wooden single-pole scaffolds shall be used only as light-duty scaffolds and be 9 m (30 ft.) or less in height.
- (2) The nominal dimensions of members of wooden single-pole scaffolds shall be not less than those specified in Table 10-3 or 10-4 as applicable.

<b>Table 10-3</b>		
<b>Single-Pole Scaffolds up to 6 m (20 ft.)</b>		
	<b>Metric</b>	<b>Imperial</b>
Uprights	0.038 m x 0.089 m	2 in. x 4 in. (nominal)
Ledgers	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Ribbons	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Bracing	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Wall scabs	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Bearers	0.038 m x 0.14 m	2 in. x 6 in. (nominal)

<b>Table 10-4</b>		
<b>Single-Pole Scaffolds 6 to 9 m (20 to 30 ft.)</b>		
	<b>Metric</b>	<b>Imperial</b>
Uprights	0.089 m x 0.089 m	4 in. x 4 in. (nominal)
Ledgers	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Ribbons	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Bracing	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Wall scabs	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Bearers	0.038 m x 0.14 m	2 in. x 6 in. (nominal)

**Uprights**

(3) Uprights shall not be spaced more than 3 m (10 ft.) apart.

**Double-pole dimensions**

(4) The dimensions of members of wooden double-pole scaffolds shall not be less than those specified in Table 10-5 or 10-6 as applicable.

**Spacing**

(5) Uprights and bearers shall be spaced not more than 3 m (10 ft.) apart in light duty double-pole scaffolds and 2.2 m (7 ft.) apart in heavy duty double-pole scaffolds.

<b>Table 10-5</b>		
<b>Light Duty Double-Pole Scaffold</b>		
<b>Up to 6 m (20 ft.)</b>		
	<b>Metric</b>	<b>Imperial</b>
Uprights	0.038 m x 0.089 m	2 in. x 4 in. (nominal)
Ledgers	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Ribbons	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Braces	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Bearers	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
<b>Over 6 m (20 ft.)</b>		
Uprights	0.089 m x 0.089 m	4 in. x 4 in. (nominal)
Ledgers	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Ribbons	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Braces	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Bearers	0.038 m x 0.14 m	2 in. x 6 in. (nominal)

<b>Table 10-6</b>		
<b>Heavy Duty Double-Pole Scaffold</b>		
<b>Up to 6 m (20 ft.)</b>		
	<b>Metric</b>	<b>Imperial</b>
Uprights	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
Ledgers	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Ribbons	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Braces	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Bearers	0.038 m x 0.14 m	2 in. x 6 in. (nominal)
<b>Over 6 m (20 ft.)</b>		
Uprights	0.089 m x 0.14 m	4 in. x 6 in. (nominal)
Ledgers	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Ribbons	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Braces	0.019 m x 0.14 m	1 in. x 6 in. (nominal)
Bearers	0.038 m x 0.14 m	2 in. x 6 in. (nominal)

#### **SCAFFOLDS – ROLLING**

- |                        |   |
|------------------------|---|
| <b>Inspection</b>      | <b>10.46</b> (1) A mobile rolling scaffold shall be inspected by a competent person before use and by the person who is to use the scaffold before each day's use.  |
| <b>Blocking wheels</b> | (2) Where a mobile rolling scaffold is equipped with pneumatic tires, the wheels shall be blocked separately in such a way as to raise the wheels off the ground or floor before the scaffold is used.  |
| <b>Height</b>          | (3) The height of the work platform shall not exceed two times the smallest base dimension, if workers are to remain on the rolling scaffold while it is being moved.<br><br>(4) The height of a rolling scaffold shall not exceed three times the smallest base dimension, if no workers remain on the rolling scaffold while it is being moved. |
| <b>Components</b>      | (5) All components of a rolling scaffold shall be securely fastened together.   |
| <b>Working surface</b> | (6) Rolling scaffolds shall be used only on surfaces that are firm, level and free of materials or debris.  |
| <b>Braces</b>          | (7) Diagonal and horizontal cross-bracing shall be installed at every level of a rolling scaffold.  |
| <b>Work platform</b>   | (8) A solid platform shall cover the entire area from which a person works.   |
| <b>Wheels</b>          | (9) The rolling platform shall have lockable wheels.  |

#### **SCAFFOLDS – THRUST-OUT AND OUTRIGGER**

- |                            |  |
|----------------------------|--|
| <b>Lumber</b>              | <b>10.47</b> (1) Lumber thrust-outs shall be construction grade dressed quality lumber at least 0.089 m x 0.14 m (4 in. x 6 in. nominal), or equivalent, placed on edge.   |
| <b>Thrust-out extended</b> | (2) The thrust-out shall not extend more than 1.1 m (42 in.) beyond the edge of the bearing surface, and the inboard portion from the fulcrum point to the point of anchorage shall be one and one-half times or more than the length of the outboard portion. |



<b>Thrust-out secured</b>	(3) The thrust-out shall be securely braced at the fulcrum point against upsetting and the inboard ends securely anchored against horizontal or vertical movement or upsetting.
<b>Counterweights not used</b>	(4) Counterweights shall not be used on outrigger and suspended outrigger scaffolds.
<b>Spacing</b>	(5) The maximum distance between thrust-outs shall be 2.1 m (7 ft.).
<b>Hangers</b>	(6) When working platforms are suspended from thrust-outs they shall be <ul style="list-style-type: none"> <li>(a) supported by 0.038 m x 0.14 m (2 in. x 6 in. nominal) or larger vertical lumber hangers not more than 3 m (10 ft.) long,</li> <li>(b) secured to the side of the thrust-out, and</li> <li>(c) extended at least 0.3 m (12 in.) above the top of the thrust-out and secured to a block that shall rest on the top edge of the thrust-out.</li> </ul>
<b>Suspended platform</b>	(7) The suspended platform shall be supported on 0.089 m x 0.14 m (4 in. x 6 in.) nominal dimension beams, secured to the vertical hangers at least 0.3 m (12 in.) above the bottom of the hanger, and resting on a block which shall be secured to the side of the hanger below the beam.
<b>Stops</b>	(8) Adequate stops shall be affixed to the thrust-out and to the platform ledger.
<b>Enclosed sides</b>	(9) On a suspended scaffold, the ends and the side of the scaffold away from the structure shall be securely enclosed with #16 gauge wire mesh or equivalent material extending from the toe board to the top rail.
<b>Mesh size</b>	(10) The wire mesh required by subsection (9) shall have cross wires no more than 0.038 m (1-1/2 in.) apart.
<b>Restriction</b>	(11) Outrigger scaffolds shall not be used for the storage of materials.
<b>Platform</b>	(12) Working platforms shall be planked completely between the hangers. (13) The suspended platform shall be braced to prevent swaying.
<b>Fall arrest</b>	(14) A worker going out on a thrust-out shall wear fall arrest equipment tied to a part of the structure that is independent of any member of the scaffold.

#### **SCAFFOLDS – SUSPENDED**

<b>Erection</b>	<b>10.48</b> (1) Manufactured suspended scaffolds shall be erected, used, operated, and maintained in accordance with the manufacturer's specifications and instructions.
<b>Suspension</b>	(2) Suspended scaffolds shall be supported by steel wire ropes suspended from overhead thrust-outs.
<b>Wire rope</b>	(3) Suspension ropes for suspended scaffolds shall be at least 0.012 m (1/2 in.) wire rope.
<b>Rope fittings</b>	(4) The suspension rope shall be attached to a thrust-out by fittings designed to secure a load equivalent to the ultimate strength of the rope.
<b>Rope terminals</b>	(5) The upper end of the suspension rope shall terminate in a spliced loop in which a steel thimble or eye is securely inserted.
<b>Shackles</b>	(6) The suspension rope shall be secured to the shackle by a bolt passing through the shackle, the steel thimble or the eye, and drawn up tightly by a securing nut.
<b>Hoist machine</b>	(7) The lower end of the suspension rope shall be firmly secured to the hoisting machine.

- Thrust-outs secured** (8) Thrust-outs shall be securely anchored to the building by U-bolts, with anchor plates tightened and made secure by washers and nuts or other approved means.
- Thrust-outs** (9) Thrust-outs shall be not less than an S180 x 22.8 (7 in. x 15.3 lbs. per ft.) I-beam, or a beam of equivalent strength, and spaced not more than 2.3 m (7 ft. 6 in.) apart.
- Placing I-beams** (10) I-beams shall be set with their webs vertical.
- Stop bolts** (11) A stop bolt shall be placed at the outer end of each thrust-out.

#### SCAFFOLDS – SWING-STAGE

- Secondary mechanism** 10.49 (1) Where safe egress is not always available, or in the event of mechanical or power failure, a powered swing-stage shall be equipped with an independent secondary mechanism or an approved individual escape device to enable the swing-stage to be moved to a point of safe egress, or to permit a worker to reach a point of safe egress.
- Suspension rope** (2) The suspension ropes for a swing-stage shall
  - (a) provide a safety factor of not less than ten, based on the ratio of the manufacturer's rated breaking strength of the wire rope to the static load, and
  - (b) be improved plow steel wire rope not less than 0.008 m (<sup>5</sup>/<sub>16</sub> in.) in diameter, or
  - (c) be manila rope not less than 0.019 m (<sup>3</sup>/<sub>4</sub> in.) in diameter, or
  - (d) be synthetic rope at least 0.016 m (<sup>5</sup>/<sub>8</sub> in.) in diameter and at least equivalent in strength to 0.019 m (<sup>3</sup>/<sub>4</sub> in.) manila.
- Work restriction** (3) Wire suspension ropes shall be used when welding, burning or similar work is being performed by workers on a swing-stage.
- Padding ropes** (4) All ropes or cables shall be padded to prevent chafing or cutting on sharp objects.
- Fall arrest** (5) Each worker on a swing-stage shall wear fall arrest equipment with the lanyard attached to a separate lifeline that is long enough to reach the ground.
- Life-lines** (6) Life-lines for workers on a swing-stage shall be tied to a part of the structure capable of supporting a load at least equal to that which the lifeline will support and shall be independent of the scaffold support structure.
- Block and tackle** (7) When the block and tackle method is used to raise or lower a swing-stage scaffold, the distance between stirrups shall not be more than 4.9 m (16 ft.).
- Bridging** (8) Two or more swing-stage scaffolds shall not be combined into one by bridging the distance between them with planks or any other form of connection.
- Working over other scaffold** (9) No swing-stage scaffold shall be used above or below another swing-stage scaffold.
- Hoarding** (10) There shall be no covering or hoarding around or over a swing-stage scaffold.
- Enclosed sides** (11) On a swing-stage scaffold where loose material or equipment is being carried
  - (a) the ends and the side of the swing-stage away from the structure shall be securely enclosed with #16 gauge wire mesh or equivalent extending from the toe board to the top rail,

- (b) the wire mesh shall be capable of rejecting a 0.038 m (1-<sup>1</sup>/<sub>2</sub> in.) ball, and
  - (c) in no case shall the cross wires of the mesh be more than 0.076 m (3 in.) apart,
- Light-duty**                    **10.50** (1) Swing-stage scaffolds shall be used only as light-duty scaffolds.
- Two workers**                    (2) No more than two workers shall be allowed on a swing-stage scaffold at any time.
- Suspension points**                    (3) A swing-stage shall be suspended from parapet clamps, cornice hooks, thrust-out beams or other solid anchorage point having at least the working load limit to that of the suspension system.
- Safety hook**                    (4) A hook used to suspend swing-staging shall have safety devices to prevent dislodgment.
- Thrust-outs**                    (5) Thrust-outs on a swing-stage shall be at least 0.089 m x 0.14 m (4 in. x 6 in. nominal) timber set on edge, or metal beams of equivalent strength, and be at least 4.9 m (16 ft.) long.
- Counterweight material**                    (6) Bagged or loose materials shall not be used as counterweights for a swing-stage.
- Counterweight factor**                    (7) The swing-stage's counterweights shall be heavy enough to counterbalance at least four times the weight of any imposed load.
- Counterweight attachment**                    (8) The swing-stage counterweights shall be firmly attached to the thrust-outs.
- Tie-backs**                    (9) A thrust-out used to suspend swing-staging shall
- (a) be securely tied back to an adequate independent anchorage on the same level as the hook or above the hook, and
  - (b) have cleats or bolts fastened at the outer ends of the thrust-out to act as safety stops.
- Safety stops**                    (10) Swing-staging shall be lowered to the ground or lashed to the building to which it is attached when the workers leave the building.
- Unattended**                    (11) The tools used to operate the release mechanism on the drive units of powered swing-staging shall be kept at all times on the platform and be readily available.
- Release mechanism tools**                    (11) The tools used to operate the release mechanism on the drive units of powered swing-staging shall be kept at all times on the platform and be readily available.
- Safety factor**                    **10.51** (1) Where supports other than thrust-outs are used to support a swing-stage, a professional engineer shall certify that all the components and the system can adequately carry a load of at least four times the maximum working load, and the supports shall be tied back to the structure or part of the structure.
- Platform**                    (2) Swing-stage platforms shall be
- (a) fastened securely to the stirrups,
  - (b) equipped with rollers or fenders which will bear against the side of the building to hold the platform at a proper distance from the wall,
  - (c) secured to prevent them from swinging or swaying away from the building or structure, and
  - (d) not less than 0.5 m (20 in.) in clear width and be either a ladder type platform or a plank type platform.
- Guardrails**                    (3) The swing-staging shall be equipped with a guardrail and toe boards.
- Hoisting winches**                    (4) The winches used for hoisting and lowering swing-staging shall have a ratchet device, a worm and gear mechanism and a locking key, or a similar device for preventing the slipping or free running of the winch drum.

## BOATSWAIN'S CHAIRS

- |                    |              |  |
|--------------------|--------------|--|
| <b>Seat</b>        | <b>10.52</b> | (1) A boatswain's chair shall be constructed of select No. 1 hardwood at least 0.025 m (1 in.) thick, or material of equivalent or greater strength.                         |
| <b>Rigging</b>     |              | (2) A boatswain's chair shall be suspended from all four corners by not less than 0.019 m ( <sup>3</sup> / <sub>4</sub> in.) manila rope, crossed diagonally under the seat. |
| <b>Back rest</b>   |              | (3) There shall be a back rest on a boatswain's chair, retaining cables to prevent swaying, and stirrups to avoid numbness of the legs of the worker.                        |
| <b>Fall arrest</b> |              | (4) A worker on a boatswain's chair shall wear fall arrest protection attached to an anchor separate from the chair.   |

## SUSPENDED CAGES

- |                                      |              |   |
|--------------------------------------|--------------|---|
| <b>Restriction</b>                   | <b>10.53</b> | (1) A suspended cage shall only be used where the work to be performed cannot be carried out by the use of conventional scaffolding, aerial devices, ladders, or other elevating devices. |
| <b>Design</b>                        |              | (2) A suspended cage that has not been commercially manufactured shall be designed and certified by a professional engineer.  |
| <b>Rated capacity</b>                |              | (3) A suspended cage shall be marked with its rated capacity (maximum load).  |
| <b>Safety factor</b>                 |              | (4) When used as part of a suspended cage assembly, suspension slings, attachments and hoisting mechanisms shall be rigged to a safety factor of 10.                                      |
| <b>Guardrails</b>                    |              | (5) A suspended cage shall be equipped with guardrails, intermediate rails and toe boards on all open sides, or shall be enclosed to a height of 1.1 m (42 in.) from the floor.           |
| <b>Drawings</b>                      |              | (6) A copy of the drawings and specifications of a suspended cage and attachments shall be forwarded to the director prior to the cage being put into service.                            |
| <b>Work awareness</b>                |              | (7) The operator of the crane and all concerned workers shall be aware of the weight of a suspended cage and its contents and any limiting factors that may affect the lift.              |
| <b>Hooks</b>                         |              | (8) All supporting hooks or shackles shall be safety wired or latched to prevent dislodging.  |
| <b>Crane type</b>                    |              | (9) Cages shall be suspended only from cranes having hoisting gear capable of raising and lowering under power and those controlled only by brakes shall not be used.                     |
| <b>Manufacturer's specifications</b> |              | (10) Cranes, power hoists and winches, or other elevating devices, shall be of a type approved by the manufacturer for hoisting workers in a suspended cage.                              |
| <b>Hoist speed</b>                   |              | (11) Suspended cage hoisting and lowering speeds shall be kept as low as practicable.   |
| <b>Dog-clutches</b>                  |              | (12) Any dog-clutches in the hoisting winch drives shall be secured against accidental disengagement when hoisting workers in a suspended cage.   |
| <b>Crane operator</b>                |              | (13) A qualified person shall operate the crane or hoist and remain at the controls while the cage is suspended.  |
| <b>Signals</b>                       |              | (14) Standard hand signals or radio communication shall be used to control movement of the cage.  |

**Fall protection** (15) Workers in a suspended cage shall wear fall protection that is attached to a substantial anchor point above the hook assembly or attached to the cage if a secondary safety line for the cage is attached to a substantial anchor point above the hook assembly.

**Two workers** (16) The number of workers in a suspended cage shall be limited to two.

#### **FORKLIFT PLATFORMS**

**Safety factor** **10.54** (1) A work platform to be mounted on a forklift shall be designed and constructed to a safety factor of 4, based on the heaviest anticipated loading.

**Attachment** (2) The platform shall be attached to the forks of the lift truck to prevent lateral or vertical movement of platform.

**Guardrails** (3) Guardrails and toe boards shall be installed on all open sides of the forklift platform.

**Mast guard** (4) A screen, mesh or similar barrier shall be provided on the mast side of the forklift platform to prevent workers from contacting the mast-hoisting apparatus.

#### **MOVING EQUIPMENT AND BUILDINGS**

**Authority** **10.55** (1) A permit or authorization shall be obtained from appropriate authorities before moving any building, load or equipment under or adjacent to any power line.

**Power lines** (2) Where a power line interferes with the proposed move, the mover shall notify the owner of the power line before the commencement of the move and request any changes and assistance required.

**Power line moving** (3) A power line shall only be moved or handled by, or under the supervision of, an electrical worker.

**Signals** (4) Where a worker is on top of a building, load or equipment, the driver shall move the vehicle only upon direction received from the worker on top through a signaller who is visible by both the driver and the worker on the top.

**Access and egress** (5) A safe means of access and egress shall be available to the worker on top of the building, load or equipment being moved.

**Fall protection** (6) Fall protection and restraint, as required in Part 1 – General, shall be provided and maintained to prevent the worker situated on the top of a building, load or equipment from slipping or falling.

#### **DEMOLITION**

**10.56** Before work begins on the demolition or salvage of machinery, equipment, buildings or structure, a competent person shall

**Inspection prior to work** (a) review any history of the object to be demolished that may be available and inspect the site to identify any asbestos, lead or other heavy metal or toxic, flammable, explosive, chemical or biological substances or materials that may be handled, disturbed or removed,

**Inspection results** (b) have the inspection results available at the workplace, including any drawings, plans or specifications, as appropriate, to show the locations and nature of any hazardous substances found,

<b>Removing hazards</b>		(c) ensure any hazardous materials identified by the inspection are safely contained or removed after procedures are reviewed by the director, or
<b>Work cessation</b>		(d) ensure that all work ceases if hazardous materials are discovered during demolition work that were not identified in the inspection required by subsection (a) until such materials are contained or removed,
<b>Glass removal</b>		(e) remove glass systematically from the top to the bottom floor, and
<b>Utilities disconnected</b>		(f) ensure that all electric, gas, telecommunication and other services have been disconnected and removed.
<b>Supervision</b>	<b>10.57</b>	(1) All demolition and dismantling work shall be carried out under the direct and continuous supervision of a competent person.
<b>Integrity of structure</b>		(2) Where a structure is to be demolished, dismantled or moved in whole or in part and where the integrity of the structure could be compromised by the demolition, the structure and any adjoining structures shall be supported in a manner prescribed by a professional engineer.
<b>Engineered support</b>		(3) The design of the support system described in subsection (2) shall include a schedule, based on the stages of demolition, for installation of the components of the support system, and a copy of the support system plan shall be available at the demolition site.
<b>Salvage</b>		(4) While salvage is taking place before or during the demolition process, the integrity of the structure shall be maintained.
<b>Work progression</b>		(5) The work above each tier or floor shall be completed before the support of the tier or floor is affected by the demolition or dismantling activity.
<b>Procedures</b>		(6) Demolition or dismantling of a building or structure shall be carried out systematically and continuously from the highest point to the lowest, unless a worker is endangered by this procedure.
<b>Structural members</b>		(7) No truss, girder or other structural member of a building or structure shall be demolished or dismantled until <ul style="list-style-type: none"> <li>(a) it is relieved of all loads other than its own weight, and</li> <li>(b) it has temporary support.</li> </ul>
<b>Bracing walls</b>		(8) Where a dangerous or unstable wall is to be left standing, it shall be adequately braced.
<b>Loose material</b>		(9) During the dismantling or renovation of a building or structure, materials of a size or weight that may endanger workers shall not be loosened or allowed to fall unless proper and safe procedures are used that will adequately protect the workers.
<b>Openings</b>	<b>10.58</b>	(1) A floor or roof opening through which material may fall during the demolition process and endanger workers shall be adequately covered.
<b>Entry</b>		(2) A worker shall enter only the part of the building or structure being demolished that will safely support him.
<b>Restricted access</b>		(3) Only workers directly engaged in the demolition, dismantling or moving of a building or structure shall be allowed in, on or near the building or structure.
<b>Scaffolds</b>		(4) A scaffold used in the demolition of a building shaft from the inside of the shaft shall be a free-standing scaffold.  (5) During demolition no worker shall stand on top of a wall, pier or chimney to remove material from it unless proper flooring, scaffolding or staging is provided on all sides of it, not more than 2.4 m (8 ft.) below the place where the worker is working.
<b>Stairs</b>		(6) Stairways, complete with handrails, shall be left intact during demolition until access to the level they serve is no longer required.

- |   |              |  |
|---|--------------|--|
| <b>Control of falling debris</b>        | <b>10.59</b> | (1) Where material is being dropped or thrown from upper floors during demolition, the area into which the material will fall shall be barricaded to prevent workers from entering the area and conspicuous warning signs shall be displayed to advise of the danger.  |
| <b>Floor capacity</b>                   |              | (2) Materials and equipment shall not be allowed to fall or accumulate on floors of the structure being demolished in quantities that will exceed the safe carrying capacity of the floor.   |
| <b>Protection from falling material</b> |              | (3) Where falling material could endanger a worker, the danger area shall be guarded to prevent entry by workers, or protected by adequate canopies.   |
| <b>Control of dust</b>                  |              | (4) Dust from demolition shall be controlled to the extent reasonably possible.  |
| <b>Accumulation of material</b>         |              | (5) Material and debris shall not be allowed to accumulate on floors or on the ground outside the building or structure being demolished if workers will be endangered.  |
| <b>Nails</b>                            |              | (6) Materials with protruding nails shall be removed, or stacked in a separate pile, or nails shall be hammered in or flat in the demolition process.  |
| <b>Use of mechanical devices</b>        | <b>10.60</b> | (1) Where any of the following methods of demolition are used, safe work procedures shall be implemented to ensure the safety of workers: <ul style="list-style-type: none"> <li>(a) a heavy weight suspended by cable from a crane or other hoisting machine,</li> <li>(b) a power shovel, bulldozer or other vehicle,</li> <li>(c) any other powered mechanical device, or</li> <li>(d) explosives.</li> </ul> |
| <b>Remote operation</b>                 |              | (2) Mechanical devices and equipment used in demolition or dismantling shall be operated from locations as remote as possible from the actual operation.   |
| <b>Restraining line or weight</b>       |              | (3) Where a swinging weight is used, the supporting cable shall be of such a length and so restrained that the weight will not swing against any other building or structure other than the one being demolished.  |
| <b>Signage</b>                          |              | (4) Construction signs and warning lights shall be placed wherever the public may be exposed to a danger from the demolition process.  |

#### **HOUSEKEEPING**

- |                                 |              |  |
|---------------------------------|--------------|--|
| <b>Daily disposal of debris</b> | <b>10.61</b> | (1) Waste material and debris shall be removed at least daily, or as often as necessary to a disposal area or if material is reusable, to a storage area.  |
| <b>Use of chutes</b>            |              | (2) Where practicable, rubbish, debris or other materials shall not be allowed to fall from one level to another, but shall be lowered through a proper scrap material chute, in a container or by a crane or hoist.   |
| <b>Exception to chutes</b>      |              | (3) Where it is not practicable to follow subsection (2) the rubbish, debris and other materials shall be permitted to fall into an enclosed designated area to which workers or the public do not have access.  |
| <b>Garbage chutes</b>           |              | (4) A scrap material chute shall be adequately constructed, rigidly fastened in place and shall <ul style="list-style-type: none"> <li>(a) be enclosed on all four sides if it has a slope exceeding a gradient of one to one,</li> <li>(b) have a gate at the bottom end if one is necessary to control the material flow, and</li> <li>(c) discharge into a container or an enclosed area surrounded by barriers.</li> </ul> |

- Garbage chute entrances**
- (5) The entrance to a scrap material chute shall
    - (a) be constructed to prevent spilling over when rubbish, debris or other materials are being deposited into the chute,
    - (b) be provided with at least 0.1 m (4 in.) high curbs, if the chute is at or below the floor level,
    - (c) not exceed 1.2 m (4 ft.) in height,
    - (d) be kept closed when the chute is not in use, and
    - (e) be designed to prevent anyone from trying to enter into it.

**TRENCHING AND EXCAVATING**

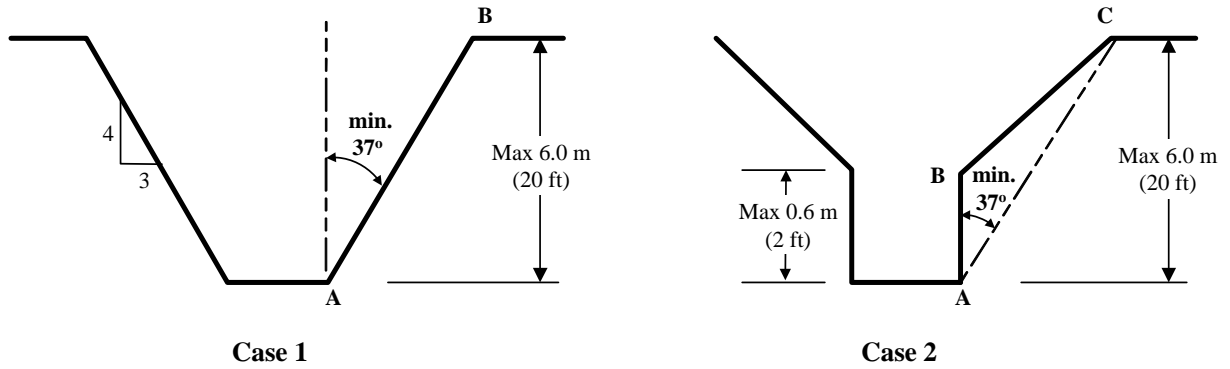
- Engineering**      **10.62** (1) Excavating, shoring, trenching or shaft work shall be carried out according to the design, instruction and procedures developed and certified by a professional engineer, considering all the factors for safe operation, including the type of soil or material to be excavated, where
- (a) the excavation or trench will be more than 6 m (20 ft.) deep,
  - (b) support structures will be used in an excavation or trench,
  - (c) an excavation or trench will be adjacent to an improvement or structure,
  - (d) the excavation or trench may be subject to hydraulic pressure or vibration which may result in ground movement,
  - (e) the ground slopes away from or downhill toward the top edge of the excavation at an angle steeper than 3 horizontal to 1 vertical,
  - (f) in a trench or excavation of any depth there are any extraordinary conditions, or
  - (g) the trench or excavation will be in permafrost.
- Written procedures**      (2) Any written procedures or instructions from a professional engineer to prevent cave-in of a trench or excavation shall
- (a) be available at the site, and
  - (b) specify the shoring support structures or the sloping requirements and the subsurface conditions that are expected,
- Notification to director**      **10.63** Prior to commencement of any trenching or excavating project, the director shall be notified and work procedures discussed
- (a) where the trench or excavation depth will exceed 6 m (20 ft.), and
  - (b) where the trenching or excavating will be done in permafrost, where ground conditions may change.
- Utilities located and marked**      **10.64** (1) All underground cables, pipes and conduits shall be located and marked with the help of the owner of the service before the commencement of excavation or drilling activity with power tools and equipment.
- Requirement near utilities**      (2) Excavating or drilling work shall be undertaken in conformity with the requirements of the owner of the service and those of the applicable regulations or specifications of the various authorities concerned.
- Uncovering utilities**      (3) Where a service poses a hazard and cannot be disconnected or shut off, the owner of the service shall be requested to attend the site to supervise the uncovering of the service during excavation.
- Hand digging**      (4) When within 0.6 m (2 ft.) of the underground utilities, the service shall be exposed by hand digging.
- Tools near utilities**      (5) Pointed tools shall not be used in probing for underground gas or electrical services, except as directed by the utility owner.



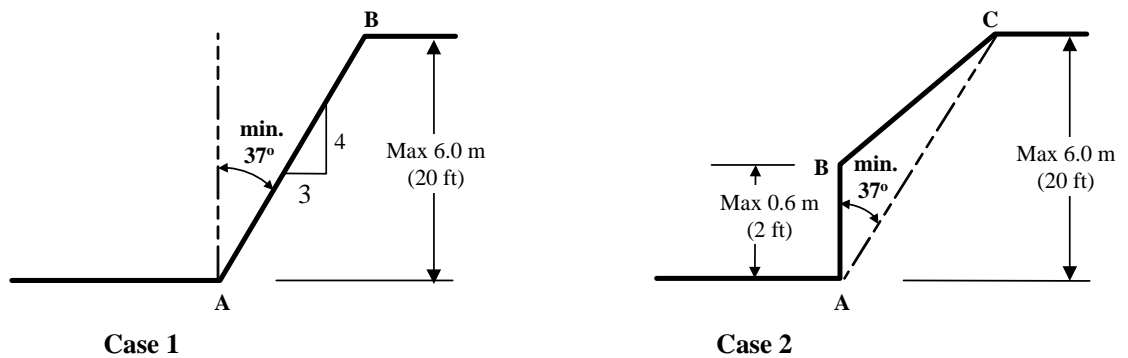
<b>Utilities supported</b>		(6) Pipes, conduits and cables for gas, electrical and other services in a trench or excavation shall be supported to prevent their damage or failure.
<b>Hazards near excavation</b>		(7) Trees, utility poles, rocks or other hazards adjacent to an area to be excavated shall be cleared or supported.
<b>Protection from cave-in</b>	<b>10.65</b>	(1) Before a worker enters any excavation or trench more than 1.2 m (4 ft.) in depth, or where a worker approaches the side or bank within a distance equal to the depth of the excavation, the excavation sidewalls shall be sloped or supported, as specified by a professional engineer, or the sidewalls of the excavation shall be, at a minimum <ul style="list-style-type: none"> <li>(a) sloped at an angle not steeper than 37 degrees from the vertical,</li> <li>(b) sloped at an angle, dependent on soil conditions, which will ensure stable faces, but in no case may the slope or combination of vertical cut and sloping exceed that shown in Figure 10-1,</li> <li>(c) benched as shown in Figure 10-2,</li> <li>(d) supported in accordance with the minimum requirements of Section 10.68, or</li> <li>(e) supported by manufactured or prefabricated trench boxes, shoring cages, or other effective means acceptable to the director.</li> </ul>
<b>Sloped sidewalls</b>		
<b>Slope tables</b>		
<b>Benching</b>		
<b>Shoring</b>		
<b>Trench boxes, cages</b>		
<b>End shoring required</b>		(2) End shoring shall be installed if the end of a trench more than 1.2 m (4 ft.) in depth is not adequately sloped unless <ul style="list-style-type: none"> <li>(a) a worker in the trench is not required to approach closer to the end of the trench than a distance equal to the depth of the trench at that end,</li> <li>(b) the permissible spacing of uprights equals or exceeds the width of the trench, or</li> <li>(c) otherwise authorized in writing by a professional engineer.</li> </ul>
<b>End shoring supports</b>		(3) Where end shoring is required, the walers for the end shoring shall be installed to bear against the walers that extend along the sides of the trench, or in a manner that will provide equivalent structural restraint.
<b>End shoring design</b>		(4) A professional engineer shall design end shoring where the end shoring waler length exceeds 1.8 m (6 ft.).
<b>End shoring dimensions</b>		(5) Shoring shall extend at least 0.3 m (1 ft.) above ground level to as close to the bottom of the trench as the material being installed will allow, but in no case more than 0.6 m (2 ft.) from the bottom of the trench.
<b>Traffic crossing plates</b>		(6) Where traffic crossing plates need to be used, shoring shall not extend above ground level provided that other measures are taken to prevent excavated and other material from entering the excavation or trench.

**Figure 10-1**  
**Sloping in Lieu of Shoring**

**Trench excavation**



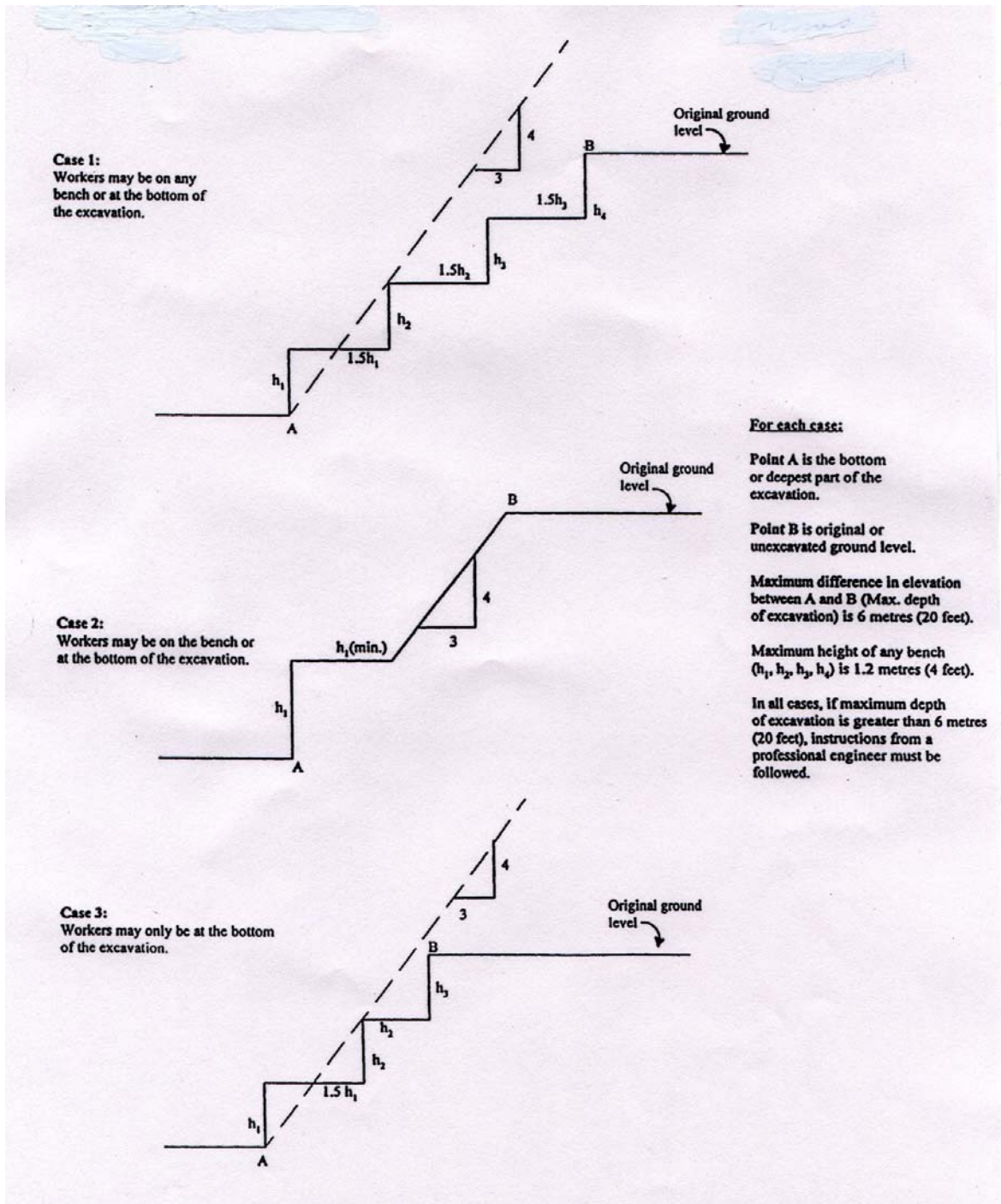
**Bulk excavation**



**Case 1:** The steepest allowable slope on the excavated face, shown as line AB, in hard and solid soil is 3 horizontal to 4 vertical, an angle of 37 degrees from the vertical, measured from the toe of the sidewall.

**Case 2:** The maximum allowable height of the vertical portion of the sidewall, shown as line AB, is 0.6 m (2 ft.). The minimum distance the sidewall must be cut back, as shown as line BC, is to the point where 37 degrees from the vertical, taken from the toe of the excavation, meets the original ground level.

Figure 10-2  
Benching in Lieu of Shoring



- Timber shoring and grades**      **10.66** (1) Timber shoring material shall be lumber graded at least No. 2 from the following species groups: Douglas fir-larch, hemlock-fir, spruce-pine-fir or coast-Sitka-spruce.
- Manufactured shoring**      (2) Manufactured shoring equipment for supporting an excavation shall be used, maintained, inspected and repaired according to instructions from the manufacturer or from a professional engineer.
- Safe shoring procedures**      **10.67** (1) Shoring material shall be installed in the trench or excavation from the top down and removed in reverse order.
- (2) Workers shall not enter an excavation to remove shoring material if the ground conditions have deteriorated so as to make entry for removal of the shoring material unsafe.
- (3) Shoring or manufactured or prefabricated support systems shall be installed in firm contact with the faces of the excavation, and in a manner that ensures soil is not lost from behind or below the bottom of the shield or shoring while the excavation is open.
- (4) Unless otherwise indicated by the manufacturer or a professional engineer in writing, voids between the shoring and the excavation faces shall be backfilled or blocked.
- Trench support structure design**      **10.68** (1) Trench support structures, other than those designed by a professional engineer, shall comply with Table 10-9 for the relevant soil conditions in Table 10-7.

<b>Table 10-7</b>	
<b>Description of Soil Type</b>	
<b>Soil Type</b>	<b>Description of Soil</b>
A	hard and solid
B	likely to crack or crumble
C	soft, sandy, filled or loose

- (2) If Table 10-9 is used for a combination of supporting and sloping, the selection of the shoring elements shall be based on the overall depth of the excavation, and the arrangement shall conform to Figure 10-3.
- Cross braces**      (3) Cross braces and trench jacks shall be installed in a horizontal position and secured against dislodgement.
- (4) The minimum number of cross braces at each cross bracing location shall be determined by the trench depth in Table 10-8.

<b>Table 10-8</b>	
<b>Number of Cross Braces by Depth</b>	
<b>Depth at location</b>	<b>Number of braces</b>
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

- Brace location** (5) At each brace location, the cross braces shall be less than 1.2 m (4 ft.) apart and the upper brace shall be within 0.6 m (2 ft.) of ground level.
- Trench jacks** (6) Manufactured trench jacks extended by a screw, hydraulic or pneumatic means shall be used in accordance with instructions from the manufacturer or a professional engineer.
- (7) Hydraulic or pneumatic jacks shall have a means of ensuring that they do not collapse in the event of loss of internal pressure.
- Shoring uprights** (8) Shoring uprights shall not spread outwards more than 15 degrees from the vertical when viewed along the trench.
- Plywood shoring** (9) Where plywood is used as substitute for 0.038 m (2 in. nominal) thick shoring elements
- (a) the plywood shall be not less than 0.019 m (<sup>3</sup>/<sub>4</sub> in.) thick,
  - (b) the trench shall be 2.7 m (9 ft.) or less in depth,
  - (c) uprights shall be installed at not more than 0.6 m (2 ft.) centres,
  - (d) cross braces shall not bear directly on plywood, and
  - (e) cross braces bearing on uprights or walers shall be located at all joints in plywood sheathing.
- Soil pressure** (10) Where the average depth of the soil pile exceeds 0.6 m (2 ft.) the selection of the shoring or shielding shall take into account the resulting increase in lateral soil pressure.

**Table 10-9  
Trench Support Structures**

**Size and Spacing of Members<sup>1</sup> (metric figures)**

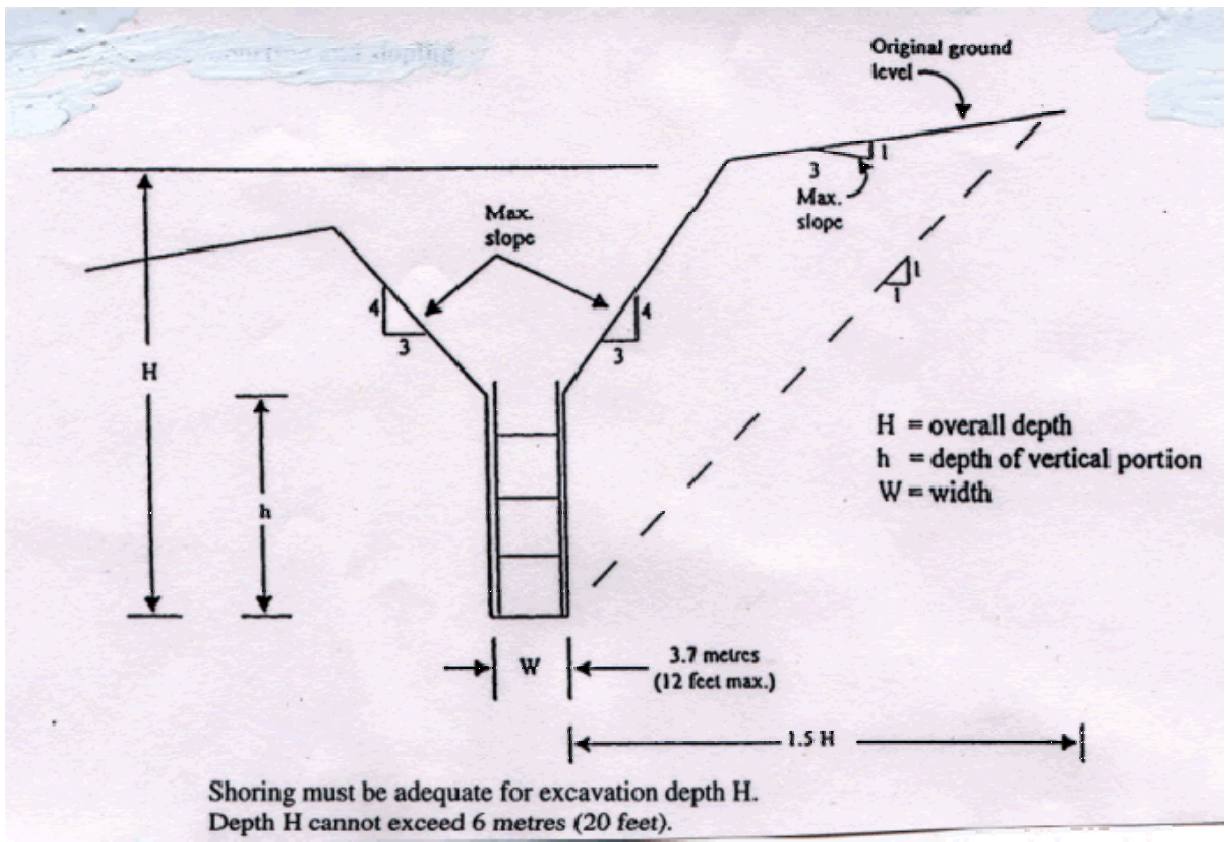
UPRIGHTS			WALERS		CROSS BRACES			
Trench depth (metres)	Minimum dimensions (millimetres) <sup>2</sup>	Maximum spacing (metres)	Minimum dimensions (millimetres) <sup>2</sup>	Maximum vertical spacing (metres)	Width of trench (metres)		Maximum spacing (metres)	
					Up to 1.8	1.8-3.7	Vertical	Horizontal
					Minimum dimensions (millimetres) <sup>2</sup>			
<i>Type A: Hard and solid soil</i>								
1.2-3 <sup>3</sup>	38 x 235	1.8	89 x 140	1.2	89 x 89	140 x 140	1.2	1.8
3-4.6	38 x 235	1.2	140 x 140	1.2	89 x 140	140 x 191	1.2	1.8
4.6-6	38 x 235	Close tight	140 x 140	1.2	140 x 191	191 x 191	1.2	1.8
<i>Type B:</i>								
1.2-3 <sup>3</sup>	38 x 235	1.2	89 x 140	1.2	89 x 140	140 x 140	1.2	1.8
3-4.6	38 x 235	0.9	140 x 191	1.2	140 x 140	140 x 191	1.2	1.8
4.6-6	38 x 235	Close tight	140 x 191	1.2	140 x 191	191 x 191	1.2	1.8
<i>Type C:</i>								
1.2-3 <sup>3</sup>	38 x 235	Close tight	140 x 191	1.2	140 x 140	140 x 191	1.2	1.8
3-4.6	38 x 235	Close tight	191 x 191	1.2	140 x 191	191 x 191	1.2	1.8
4.6-6	64 x 235	Close tight	191 x 241	1.2	140 x 191	191 x 241	1.2	1.8

**Size and spacing of members<sup>1</sup> (imperial figures)**

UPRIGHTS			WALERS		CROSS BRACES			
Trench depth (feet)	Minimum dimensions (inches) <sup>2</sup>	Maximum spacing (feet)	Minimum dimensions (inches) <sup>2</sup>	Maximum vertical spacing (feet)	Width of trench (feet)		Maximum spacing (feet)	
					Up to 6	6-12	Vertical	Horizontal
					Minimum dimensions (inches) <sup>2</sup>			
<i>Type A: Hard and solid soil</i>								
4-10 <sup>3</sup>	2 x 10	6	4 x 6 <sup>4</sup>	4	4 x 4	6 x 6	4	6
10-15	2 x 10	4	6 x 6	4	4 x 6	6 x 8	4	6
15-20	2 x 10	Close tight	6 x 6	4	6 x 8	8 x 8	4	6
<i>Type B: Soil likely to crack or crumble</i>								
4-10 <sup>3</sup>	2 x 10	4	4 x 6	4	4 x 6	6 x 6	4	6
10-15	2 x 10	3	6 x 8	4	6 x 6	6 x 8	4	6
15-20	2 x 10	Close tight	6 x 8	4	6 x 8	8 x 8	4	6
<i>Type C: Soft, sandy, filled or loose soil</i>								
4-10 <sup>3</sup>	2 x 10	Close tight	6 x 8	4	6 x 6	6 x 8	4	6
10-15	2 x 10	Close tight	8 x 8	4	6 x 8	8 x 8	4	6
15-20	3 x 10	Close tight	8 x 10	4	6 x 8	8 x 10	4	6

- 1 The dimensions shown are minimum and must be increased, if necessary, to meet job conditions.
- 2 The dimensions of members in millimetres are actual dimensions for surfaced dry materials. The dimensions in inches are the nominal values for surfaced dry materials.
- 3 Trenches less than 1.2 m (4 ft.) deep must be shored when hazardous ground movement may be expected, as in ground subject to hydrostatic pressure or vibration.
- 4 Walers may be omitted in trenches not exceeding 2.4 m (8 ft.) in depth provided that it has been confirmed that the soil is sufficiently hard and solid to safely permit waler deletion, and provided that the trench is not in proximity to previously excavated ground.

Figure 10-3  
Combined Supporting and Sloping



- |                           |              |   |
|---------------------------|--------------|---|
| <b>Entry and exit</b>     | <b>10.69</b> | (1) A safe means of entry and exit shall be provided for each excavation or trench that a worker enters.  |
| <b>Exit location</b>      |              | (2) Where workers are required to enter a trench more than 1.2 m (4 ft.) deep, the safe points of entry and exit shall be located within 8 m (25 ft.) of the workers and the excavation shall be safely supported or sloped to the entry and exit location.   |
| <b>Exit type</b>          |              | (3) Where the means of entry and exit <ul style="list-style-type: none"> <li>(a) is a ladder, it shall extend from the bottom of the trench to 1 m (3 ft.) beyond the top edge, or</li> <li>(b) is a ramp, it shall be sloped so that a worker can safely walk in and out of the trench.</li> </ul> |
| <b>Walkways</b>           |              | (4) Walkways across or along a trench or excavation shall be secured to prevent dislodgement.   |
| <b>Ramp curbs</b>         |              | (5) The open side of a ramp used by mobile equipment to enter or exit an excavation shall have a curb or berm.  |
| <b>Excavated material</b> | <b>10.70</b> | (1) Excavated material shall be kept back at least 0.6 m (2 ft.) from the edge of a trench and 1.2 m (4 ft.) from any other excavation.   |
|                           |              | (2) Under no circumstances shall excavated material be piled such that it poses a danger to workers.  |

- Scaled sidewalks** (3) The sides of an excavation or trench shall be scaled and trimmed or otherwise stabilized to prevent slides of material or falls of rock that could endanger workers.
- Height limitations – excavations** **10.71** The height of unstable faces in pits, quarries or similar excavations shall not exceed the maximum safe reach of the excavating equipment being used, and in no instance shall stable faces be more than 1.5 m (5 ft.) above the maximum reach of the equipment.
- Water accumulations** **10.72** (1) Water shall not be allowed to accumulate in or above an excavation or trench if it might affect stability of the excavation or endanger workers.
- (2) Erosion of the slopes of a trench or excavation by surface water shall be prevented where workers will be required to enter the trench or excavation.

### ROCK SCALING

- Falling material** **10.73** (1) Rock scaling and similar work shall be undertaken from the top down, and any area into which material may fall shall be kept clear of workers and equipment.
- Fall protection** (2) A worker on a rock face or other steep slope shall be protected from falling by a work positioning system, a rappelling system or a fall arrest system.
- Rappelling** (3) A single-rope work positioning system used by a worker to rappel or remain in a work location on a rock face or other steep slope shall be maintained with tension on the rappel rope at all times to prevent free fall of the worker.
- Independent enclosing** (4) Where a work practice could result in a slack line in the rappel or work positioning system and a fall could occur, an independently anchored personal fall arrest system shall be used by a worker.
- Rappelling systems** (5) A rappelling system shall be provided with automatic stopping by means of a mechanical fall arrestor, Prusik sling or other similar device acceptable to the director.
- Rappelling procedure** (6) A rappelling or fall protection system shall be used in a manner that minimizes the swing-fall hazard.
- Rappelling ropes, anchors and harness** **10.74** (1) A rappelling rope shall be
- (a) synthetic fibre rope with a breaking strength specified by the manufacturer of at least 27 kN (6000 lbs.) or is at least 0.016 m (<sup>5</sup>/<sub>8</sub> in.) diameter wire-cored fibre rope,
  - (b) long enough to reach a safe landing spot from which safe egress without rappelling is possible, and
  - (c) attached to an anchor, and, where practicable, positioned to avoid bearing on any sharp edge or surface likely to cause rope damage.
- (2) Where it is not practicable to avoid sharp edges or surfaces, rope protectors or wire-cored rope shall be used.
- (3) A rappelling rope shall not be lengthened by tying ropes together.
- Natural anchors** **10.75** (1) Each rappel line and fall arrest lifeline tied to a natural anchor such as a tree, stump or rock outcrop shall also be tied to a second anchor of an equal load capacity.
- (2) The ultimate load capacity of an anchor for a rappelling or fall protection line shall be at least 22 kN (5000 lbs.).



## WORK AREAS OVER WATER

- Work plan**                    **10.76** (1) Where workers are required to work near or over water where there is risk of falling and drowning, an effective plan shall be developed and implemented to protect and rescue workers.
- Rescue equipment**                    (2) Where workers are working near or over water and are not protected by guardrails or other means of fall protection as required in Part 1 – General, the following shall be provided:
- (a) a rescue boat of suitable size and capacity, equipped with a boat hook, available at the site and capable of being used for rescue at all times,
  - (b) a buoyant apparatus attached to a nylon rope not less than 0.009 m ( $\frac{3}{8}$  in.) in diameter, and not less than 15 m (50 ft.) in length,
  - (c) a sufficient number of workers who are available when work is underway to implement rescue or evacuation procedures and who are properly equipped, instructed and trained in those procedures,
  - (d) a trained person operating the boat and another person to assist with a rescue, and
  - (e) personal flotation devices for each worker.
- Rescue boat**                    (3) When work is being performed over a river, the rescue boat shall be stationed downstream from the work.
- Work on ice**                    (4) When work is performed on ice, tests shall be conducted to ensure the ice is capable of supporting the load to be placed on it prior to workers going on the ice.
- Ice thickness**                    (5) In no instance shall a worker work or remain on ice that is less than 0.1 m (4 in.) in thickness.
- Driving on ice**                    (6) Workers required to work or drive on ice shall be trained in the hazards associated with being on ice and given rescue survival training in case of breakthrough.

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