

*Nova Scotia Industry Stakeholders
Code of Practice
for
Steel Erection*



Produced By: The Nova Scotia Steel Erection Industry

This Page Blank
Intentionally

Acknowledgement

The *Steel Erector's Code of Practice* was developed through the efforts of a working technical committee, representing the Nova Scotia steel erection industry.

The United States Department of Labor, Occupational Safety & Health Administration, *Safety Standards for Steel Erection** was used as the foundation document during the development of this *Code of Practice*.

The technical committee acknowledges the participation and support of a number of individuals and organizations that contributed to the development of this document:

Lorne Butler	- <i>RKO Steel</i>
Steve England	- <i>Cherubini Metal Works</i>
Dave Guthro	- <i>RKO Steel</i>
Nick MacDonald	- <i>RKO Steel</i>
Roddie MacLennan	- <i>Iron Workers Union Local 752</i>
Paul Midgley	- <i>JW Lindsay Enterprises</i>
Harry Neynens	- <i>Marid Industries</i>
Dave Oulton	- <i>Marid Industries</i>
Ernie Porter	- <i>JW Lindsay Enterprises</i>
Bob Power	- <i>Cherubini Metal Works</i>
Frank Robinson	- <i>B.D. Stevens Group</i>
John Wilson	- <i>Iron Workers Union Local 752</i>

The Nova Scotia Construction Safety Association provided administrative support and acted as facilitator for the document development process. The following firms/organizations also provided support via consultation/feedback:

Association of Professional Engineers Nova Scotia
Nova Scotia Transportation and Public Works
Nova Scotia Environment and Labour

The technical committee also expresses its sincere thanks to the management and staff of the OH&S Division, Environment and Labour for their technical expertise and support in bringing this project to completion.

Sincerely,

The Technical Committee
February 20, 2006

* *OSHA Subpart R - Steel Erection 126.750, reproduced with permission*

This Page Blank
Intentionally

Table of Contents

Application	Part 1	Pg. 1
Scope	Part 2	Pg. 1
Definitions	Part 3	Pg. 3
Site Layout, Site Specific Erection Plan, and Construction Sequence	Part 4	Pg. 12
Hoisting and Rigging	Part 5	Pg. 13
Structural Steel Assembly	Part 6	Pg. 15
Column Anchorage	Part 7	Pg. 19
Beams and Columns	Part 8	Pg. 20
Open Web Steel Joists	Part 9	Pg. 21
Steel Erection	Part 10	Pg. 22
Systems - Engineered Metal Buildings	Part 11	Pg. 24
Falling Object Protection	Part 12	Pg. 25
Custody of Fall Protection Systems	Part 13	Pg. 26
Training	Part 14	Pg. 26
Appendix A - Guidelines for establishing the components of a site specific erection plan		Pg. 29
Appendix B - Safety Plan		Pg. 33
Appendix C - Illustrations of bridging terminus points (non mandatory)		Pg. 35
Appendix D - Training		Pg. 39
Appendix E - Perimeter columns		Pg. 39
Appendix F - Double connections: Illustration of a clipped end connection and a staggered connection		Pg. 41
Appendix G - Excerpts - NS Occupation Safety General Regulations		Pg. 43
Appendix H - NS Fall Protection and Scaffolding Regulations		Pg. 59
Reference		Pg. 89

This Page Blank
Intentionally

Steel Erection - Industry Code of Practice

1. Application

This code of practice is binding on any employer required by the Executive Director of the Occupational Health and Safety Division of Nova Scotia Environment and Labour to adopt this code. In addition, it can be used as guidance for any constructor active in the steel erection industry.

2. Scope

(a) This Code of Practice sets forth minimum requirements to protect employees from the hazards associated with steel erection activities involved in the construction, alteration, and/or repair of single and multi-story buildings, bridges, and other structures where steel erection occurs. The requirements of this Code of Practice apply to employers engaged in steel erection unless otherwise specified. This code does not cover electrical transmission towers, communication and broadcast towers, or tanks.

Note to paragraph (a): Examples of structures where steel erection may occur include but are not limited to the following:

Single and multi story buildings; systems-engineered metal buildings; pre cast concrete panels; double t's; hollow core slabs; lift slab/tilt-up structures; energy exploration structures; energy production, transfer and storage structures and facilities; auditoriums; malls; amphitheatres; stadiums; power plants; mills; chemical process structures; bridges; trestles; overpasses; underpasses; viaducts; aqueducts; aerospace facilities and structures; radar and communication structures; light towers; signage; billboards; scoreboards; conveyor systems; conveyor supports and related framing; stairways; stair towers; fire escapes; draft curtains; fire containment structures; mono-rails; aerial pedways; cat walks;

curtain walls; window walls; store fronts; elevator fronts; entrances; skylights; metal roofs; industrial structures; hi-bay structures; rail, marine and other transportation structures; sound barriers; water process and water containment structures; air and cable-supported structures; space frames; geodesic domes; canopies; racks and rack support structures and frames; platforms; walkways; balconies; atriums; penthouses; car dumpers; stackers/reclaimers; cranes and crane ways; bins; hoppers; ovens; furnaces; stacks; amusement park structures and rides; and artistic and monumental structures.

(b) **(i)** Steel erection activities include:

On-site fabricating; hoisting; laying out; placing; connecting; welding; burning; guying; bracing; bolting; plumbing and rigging structural steel; steel joists and metal buildings; installing metal decking; curtain walls; window walls; siding systems; miscellaneous metals; ornamental iron and similar materials; and moving point-to-point while performing these activities.

(ii) The following activities are covered by this code when they occur during and are a part of steel erection activities:

Rigging; hoisting; laying out; placing; connecting; guying; bracing; dismantling; burning; welding; bolting; grinding; sealing; caulking and all related activities for construction; alteration and/or repair of materials and assemblies such as structural steel; ferrous metals and alloys; non-ferrous metals and alloys; glass; plastics and synthetic composite materials; structural metal framing and related bracing and assemblies; anchoring devices; structural cabling; cable stays; permanent and temporary bents and towers; false work for temporary supports to permanent steel members; stone and other non-pre cast concrete architectural materials mounted on steel frames; safety systems for steel erection; steel and metal joists; metal decking and raceway systems and accessories; metal roofing and accessories; metal siding; steel bridge elements including trusses; beams and stringers; bridge flooring; cold formed steel framing; elevator beams; grillage;

shelf racks; multi-purpose supports; crane rails and accessories; miscellaneous architectural and ornamental metals and metal work; ladders; railings; handrails; fences and gates; gratings; trench covers; floor plates; castings; sheet metal fabrications; metal panels and panel wall systems; louvers; column covers; enclosures and pockets; stairs; perforated metals; ornamental iron work; expansion control including bridge expansion joint assemblies; slide bearings; hydraulic structures; fascias; soffit panels; penthouse enclosures; sky lights; joint fillers; gaskets; sealants and seals; doors; windows; hardware; detention/security equipment and doors; windows and hardware; conveying systems; building specialties; building equipment; machinery and plant equipment; furnishings and special construction.

3. Definitions

Anchor Bolt: a mechanical fastener for securing column to base. Bolts/anchors must meet CSA A23.3 Standard and section 7(a)(ii).

Anchored Bridging: that the steel joist bridging is connected to a bridging terminus point.

Bolted Diagonal Bridging: diagonal bridging that is bolted to a steel joist or joists.

Bridging Clip: a device that is attached to the steel joist to allow the bolting of the bridging to the steel joist.

Bridging Terminus Point: a wall, a beam, tandem joists (with all bridging installed and a horizontal truss in the plane of the top chord) or other element at an end or intermediate point(s) of a line of bridging that provides an anchor point for the steel joist bridging.

Choker: a wire rope or synthetic fiber rigging assembly that is used to attach a load to a hoisting device.

Cold Forming: the process of using press brakes, rolls, or other methods to shape steel into desired cross sections at room temperature.

Column: a load-carrying vertical member that is part of the primary skeletal framing system. Columns do not include posts.

Competent Person: a person who is:

- (i) qualified because that person's knowledge, training and experience to do the assigned work in a manner will ensure the health and safety of every person in the workplace, and
- (ii) knowledgeable about the provisions of the Act and regulations that apply to the assigned work, and about potential or actual danger to health or safety associated with the assigned work.

Competent Rigger: a person who is competent (see above *Competent Person*) with demonstrated knowledge in:

- hoisting and rigging hazards; - fibre rope, knots, and hitches;
- hardware, wire rope, and slings; - rigging tools and devices; and
- hazards associated with the interaction of rigging and crane operation, as they pertain to the specific work environment and function. Training may be demonstrated through trade qualification or recognized course.

Persons using rigging hardware must be designated competent by their employer (see also Designated pg. 6).

Competent Supervisor: a supervisor who is:

- (i) qualified because that person's knowledge, training and experience to do the assigned work in a manner that will ensure the health and safety of every person in the workplace, and
- (ii) knowledgeable about the provisions of the Act and regulations that apply to the assigned work, and about potential or actual danger to health or safety associated with the assigned work, and
- (iii) one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Connector: an employee who, working with hoisting equipment, is placing and connecting structural members and/or components.

Constructability: the ability to erect structural steel members in accordance with the *Code of Practice* without having to alter the overall structural design.

Constructor: a person who contracts for work on a project or who undertakes work on project himself or herself.

Controlling Constructor: the constructor or person who enters into an agreement with the owner of the work site or project to be *prime contractor*. The prime contractor is a general contractor, construction manager or any other legal entity that has overall responsibility for the construction of the project — its planning, quality and completion. If there is no agreement or the agreement is not in force at the time of an accident, then the owner, by default, is the controlling constructor.

Construction Load (*for joist erection*): any load other than the weight of the employee(s) and the joists.

Controlled Load Lowering: lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.

Critical Lift: a lift that:

- (i) exceeds 75 percent of the rated capacity of the crane or derrick, or
- (ii) requires the use of more than one crane or derrick.

Debris Net: a net that is used to catch material and debris that can drop from work areas.

Decking Hole: a gap or void of more than 2 inches (5.1 cm) in its least dimension and less than 12 inches (30.5 cm) in its greatest dimension in a floor, roof or other walking/working surface. Pre-engineered holes in cellular decking (for wires, cables, etc.) are not included in this definition.

Derrick Floor: an elevated floor of a building or structure that has been designated to receive hoisted pieces of steel prior to final placement.

Design Load: is the maximum load the structure may carry safely as designed by the engineer once assembly is complete.

Designated: is designated, in writing, by the employer unless otherwise specifically provided (*excerpt from the Nova Scotia Occupational Safety General Regulation's*).

Double Connection: an attachment method where the connection point is intended for two pieces of steel that share common bolts on either side of a central piece.

Double Connection Seat: a structural attachment that, during the installation of a double connection, supports the first member while the second member is connected.

Erection Bridging: the bolted diagonal bridging that is required to be installed prior to releasing the hoisting cables from the steel joists.

Erection Drawing: drawing(s) prepared by the steel fabrication contractor providing details to the erection crew of how the pieces are to be assembled, and providing part identification and orientation.

Fall Arrest System: a system of physical components attached to a person that stops a person during a fall.

Fall Protection: a harness, net, rope, safety belt, structure or other equipment, or device or means of:

- (i) restraining a person who is at risk of falling, or
- (ii) stopping a person who has fallen.

Final Interior Perimeter: the perimeter of a large permanent open space within a building such as an atrium or courtyard. This does not include openings for stairways, elevator shafts, etc.

Girt: a Z or C-shaped member formed from sheet steel spanning between primary framing and supporting wall material.

Headache Ball: a weighted hook that is used to attach loads to the hoist load line of the crane.

Hoist: a mechanical device or equipment and its structure used for moving, lifting, or lowering material, including a mobile crane, a tower crane, an electric overhead travelling crane, an automotive lift, a winch, a chain fall or other similar device, but does

not include an industrial lift truck, a power operated elevating work platform, a device to which the *Elevators and Lifts Act* applies or a hoist that operates in a shaft in the underground at a mine (*excerpt from the Nova Scotia Occupational Safety General Regulation's*).

Leading Edge: the unprotected side and edge of a floor, roof, or form work for a floor or other walking/working surface (such as deck) which changes location as additional floor, roof, decking or form-work sections are placed, formed or constructed. Metal decking means a commercially manufactured, structural grade, cold-rolled metal panel formed into a series of parallel ribs. For this code, this includes metal floor and roof decks, standing seam metal roofs, other metal roof systems and other products such as bar gratings, checker plate, expanded metal panels, and similar products. After installation and proper fastening, these decking materials serve a combination of functions including, but not limited to: a structural element designed in combination with the structure to resist, distribute and transfer loads, stiffen the structure and provide a diaphragm action; a walking/working surface; a form for concrete slabs; a support for roofing systems; and a finished floor or roof.

Opening: a gap or void of 12 inches (30.5 cm) or more in its least dimension in a floor, roof or other walking/working surface. For the purposes of this code, skylights and smoke domes that do not meet the strength requirements outlined in 14(2)(b) of the Fall Protection and Scaffolding Regulations shall be regarded as openings.

Permanent Floor: a structurally completed floor at any level or elevation (including slab on grade).

Positioning Device System: a body belt or body harness rigged to allow an employee to be supported on an elevated vertical surface, such as a wall or column and work with both hands free while leaning. A work positioning device must be used in conjunction with a method of fall protection if exposure to fall hazard exists (Section 7 Fall Protection and Scaffolding Regulation).

Post: a structural member with a longitudinal axis that is essentially vertical, that:

- (i) weighs 300 pounds or less and is axially loaded (a load presses down on the top end), or
 - (ii) is not axially loaded, but is laterally restrained by the above member.
- Posts typically support stair landings, wall framing, mezzanines and other substructures.

Project Structural Engineer of Record: the registered, licensed professional responsible for the design of structural steel framing and whose seal appears on the structural contract documents.

Purlin: a Z or C-shaped member formed from sheet steel spanning between primary framing and supporting roof material.

Qualified Person: one who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, experience and understanding of the applicable laws, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

Safety Choker: a wire rope or synthetic fiber rigging assembly that is used as an anchorage connector to anchor point.

Safety Deck Attachment: an initial attachment that is used to secure an initially placed sheet of decking to keep proper alignment and bearing with structural support members.

Safety Plan: a document package constructed to assist in the management of OH&S on a project. A safety plan may be trade specific or a compilation of several trades to form a project safety plan. The plan will include a hazard assessment with identified critical tasks and related controls. In addition, policy statements, practices and procedures, and a

communication chart will be included. Additional information is included in the appendix.

Shear Connector: headed steel studs, steel bars, steel lugs and similar devices which are attached to a structural member for the purpose of achieving composite action with concrete.

Site Specific Erection Plan: where the steel erectors elect, due to conditions specific to the site, to develop alternate means and methods that provide employee protection, a request must be made in writing to the Executive Director - OH&S Division, NS Environment and Labour. Guidelines for establishing a site-specific erection plan are contained in Appendix A to this *Code of Practice*.

Steel Erection: the construction, alteration or repair of steel buildings, bridges and other structures, including the installation of metal decking and all planking used during the process of erection.

Steel Joist: an open web, secondary load-carrying member of 144 feet (43.9 m) or less, designed by the manufacturer, used for the support of floors and roofs. This does not include structural steel trusses or cold-formed joists.

Steel Joist Girder: an open web, primary load-carrying member, designed by the manufacturer, used for the support of floors and roofs. This does not include structural steel trusses.

Steel Truss: an open web member designed of structural steel components by the project Structural Engineer of Record. For the purposes of this code, a steel truss is considered equivalent to a solid web structural member.

Structural Steel: a steel member, or a member made of a substitute material (such as, but not limited to, fibreglass, aluminum or composite members). These members include,

but are not limited to, steel joists, joist girders, purlins, columns, beams, trusses, splices, seats, metal decking, girts, and all bridging, and cold- formed metal framing that is integrated with the structural steel framing of a building.

Systems-Engineered Metal Building: a metal, field-assembled building system consisting of framing, roof and wall coverings. Typically, many of these components are cold-formed shapes. These individual parts are fabricated in one or more manufacturing facilities and shipped to the job site for assembly into the final structure. The engineering design of the system is normally the responsibility of the systems-engineered metal building manufacturer.

Tank: a container for holding gases, liquids or solids.

Unprotected Sides and Edges: any side or edge (except at entrances to points of access) of a walking/working surface. Examples include: floor, roof, ramp or runway, where there is no wall or guardrail system at least 42 inches (1.06 m) high.

Work Platform: a temporary horizontal working surface that provides access and support to a person at the workplace (*excerpt NS Fall Protection and Scaffolding Regulation*).

4. Site Layout, Site-Specific Erection Plan, and Construction Sequence

(a) Approval to Begin Steel Erection

Before authorizing the commencement of steel erection, the controlling constructor shall ensure that the steel erector is provided with the following written notifications:

(i) The concrete in the footings, piers and walls and the mortar in the masonry piers and walls has attained, on the basis of an appropriate CSA standard test method of field-cured samples, either 75 per cent of the intended minimum compressive design strength, or sufficient strength to support the loads imposed during steel erection.

(ii) Anchor bolts and/or rods have been installed in accordance with plans, specifications and manufacturer's requirements.

(iii) When required by site conditions, notification of contact with affected utility companies (obtain clearance report).

(iv) Any repairs, replacements and modifications to the anchor bolts were conducted in accordance with 7(b).

(b) Commencement of Steel Erection

A steel erection constructor shall not erect steel unless they have received written notification that the concrete in the footings, piers and walls or the mortar in the masonry piers and walls has attained, on the basis of an appropriate CSA standard test method of field-cured samples, either 75 per cent of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.

(c) Site Layout

The controlling constructor shall ensure that the following is provided and maintained:

(i) Adequate access roads into and through the site for the safe delivery and movement of derricks, cranes, trucks, other necessary equipment, and the material

to be erected and means and methods for pedestrian and vehicular control.

Exception: this requirement does not apply to roads outside of the construction site.

(ii) A firm, properly graded, drained area, readily accessible to the work with adequate space for the safe storage of materials and the safe operation of the erector's equipment.

(d) **Pre-Planning of Overhead Hoisting Operations**

All hoisting operations in steel erection shall be pre-planned to ensure that the requirements of Part 5 are met.

(e) **Site-Specific Erection Plan** (*Deviation from the Code of Practice*)

Where the steel erectors elect, due to conditions specific to the site, to develop alternate means and methods that provide employee protection, request must be made in writing to the Executive Director OH&S Division, NS Environment and Labour. Work may not commence on the activity in question prior to formal written approval by the Executive Director. Guidelines for establishing a site-specific erection plan are contained in Appendix A to this *Code of Practice*.

5. Hoisting and Rigging

(a) All the provisions of Part 7 - Hoists and Mobile Equipment, Occupational Safety General Regulations apply;

(b) In addition, paragraph (c) of this section applies regarding the hazards associated with hoisting and rigging.

- (c) General:
- (i) Cranes being used in steel erection activities shall be used in accordance with the *Crane Operators and Power Engineers Act* and the *Crane Operators Regulations*.
 - (ii) A competent rigger shall inspect the rigging prior to each use.
 - (iii) The headache ball, hook or load shall not be used to transport personnel except as provided in paragraph (c)(iv) of this section.
 - (iv) Cranes or derricks can only be used to hoist employees on a personnel platform when work under this code is being conducted, provided that all provisions of part 37, Fall Protection and Scaffolding Regulations are met.
- (d) Safety latches on hooks shall not be deactivated or made inoperable.
- (e) Working under loads:
- (i) Routes for suspended loads shall be pre-planned to ensure that no employee is required to work directly below a suspended load except for:
 - (ii) Employees engaged in the initial connection of the steel; or
 - (iii) Employees necessary for the hooking or unhooking of the load.
 - (iv) Where it is not reasonably practical to divert the traffic route of persons or use another lifting route.
- (f) When working under suspended loads, the following criteria shall be met:
- (i) The employer must develop a written work procedure to provide adequate warning or information about the hazard to people at or near the work place;

(ii) Materials being hoisted shall be rigged to prevent unintentional displacement;

(iii) Hooks with self-closing safety latches or their equivalent shall be used to prevent components from slipping out of the hook; and

(iv) All loads shall be rigged by a designated competent rigger.

6. Structural Steel Assembly

(a) Structural stability shall be maintained at all times during the erection process.

(b) The following additional requirements shall apply for multi-story structures:

(i) The permanent floors shall be installed as the erection of structural members progresses, and there shall be not more than eight stories between the erection floor and the upper-most permanent floor, except where the structural integrity is maintained as a result of the design.

(ii) At no time shall there be more than four floors or 48 feet (14.6 m), whichever is less, of unfinished bolting or welding above the foundation or uppermost permanently secured floor, except where the structural integrity is maintained as a result of the design.

(c) Walking/Working surfaces:

(i) Shear connectors and other similar devices.

(ii) Tripping hazards: Shear connectors (such as headed steel studs, steel bars or steel lugs), reinforcing bars, deformed anchors or threaded studs shall not be attached to the top flanges of beams, joists or beam attachments so that they project vertically from or horizontally across the top flange of the member until

after the metal decking, or other walking/working surface, has been installed.

(iii) Installation of shear connectors on composite floors, roofs and bridge decks:
When shear connectors are used in construction of composite floors, roofs and bridge decks, employees shall lay out and install the shear connectors after the metal decking has been installed, using the metal decking as a working platform.

(d) Plumbing-up:

(i) When deemed necessary by a competent person, plumbing-up equipment shall be installed in conjunction with the steel erection process to ensure the stability of the structure.

(ii) Plumbing-up equipment shall be removed only with the approval of a competent person.

(e) Metal decking:

(i) Hoisting, landing and placing of metal decking bundles.

(1) Bundle packaging and strapping shall not be used for hoisting unless specifically designed for that purpose.

(2) If loose items such as dunnage, flashing, or other materials are placed on the top of metal decking bundles to be hoisted, such items shall be secured to the bundles.

(3) Bundles of metal decking on joists shall be landed in accordance with sections 10 & 11.

(4) Metal decking bundles shall be landed on framing members so that enough support is provided to allow the bundles to be unbanded without dislodging the bundles from the supports.

(5) At the end of the shift or when environmental or job site conditions

require, metal decking shall be secured against displacement.

(ii) Roof and floor holes and openings: Metal decking at roof and floor holes and openings shall be installed as follows:

(1) Framed metal deck openings shall have structural members turned down to allow continuous deck installation except where not allowed by structural design constraints or constructibility.

(2) Roof and floor holes and openings shall be decked over. Where large size, configuration, or other structural design does not allow openings to be decked-over (such as elevator shafts stair wells, etc.) employees shall be protected in accordance with the *Fall Protection and Scaffolding Regulation*

(3) Metal decking holes and openings shall not be cut until immediately prior to being permanently filled with the equipment or structure needed or intended to fulfill its specific use and which meets the strength requirements of paragraph (e)(iii) of this section, or shall be immediately covered.

(4) The constructor shall provide written notice to the controlling constructor of the immediate availability of the opening and the requirement to comply with 6 (e)(ii)(3). The controlling constructor shall provide acknowledgement/receipt of notice. Openings are not to be left unguarded at any time.

(iii) Covering roof and floor openings:

(1) Covers for roof and floor openings shall be capable of supporting, without failure, four times the weight of the employees, equipment and materials that may be imposed on the cover at any one time.

(2) All covers shall be secured when installed to prevent accidental displacement by the wind, equipment or employees.

(3) All covers shall be painted with high-visibility paint or shall be marked with the word HOLE COVER, or other appropriate descriptor to provide warning of the hazard.

(4) Smoke dome or skylight fixtures that have been installed are not considered covers for the purpose of this section unless they meet the strength requirements of paragraph (e)(iii)(1) of this section.

(iv) Decking gaps around columns: Wire mesh, exterior plywood, or equivalent, shall be installed around columns where planks or metal decking do not fit tightly. The materials used must be of sufficient strength to provide fall protection for personnel and prevent objects from falling through.

(v) Installation of metal decking:

(1) Metal decking shall be laid tightly and immediately secured upon placement to prevent accidental movement or displacement.

(2) During initial placement, metal decking panels shall be placed to ensure full support by structural members.

(vi) Derrick floors:

(1) A derrick floor shall be fully decked and/or planked, and the steel member connections completed to support the intended floor loading.

(2) Temporary loads placed on a derrick floor shall be distributed over the underlying support members so as to prevent local overloading of the deck material.

7. Column Anchorage

- (a) General requirements for erection stability:
- (i) All columns less than 6 metres shall be anchored by a minimum of 2 - 3/4" (19mm), anchor rods (anchor bolts). Columns over 6 metres require 4 - 3/4" (19mm), anchor rods (anchor bolts).
 - (ii) Each column anchor rod (anchor bolt) assembly, including the column-to-base plate weld and the column foundation, shall be designed to resist a minimum eccentric gravity load of 300 pounds (136.2 kg) located 18 inches (.46m) from the extreme outer face of the column in each direction at the top of the column shaft.
 - (iii) Columns shall be set on level surfaces, levelling nuts, or shim packs which are adequate to transfer the construction load.
 - (iv) If column guying or bracing is required, it shall be installed as indicated by the project Structural Engineer of Record.
- (b) Repair, replacement or field modification of anchor rods (anchor bolts):
- (i) Anchor rods (anchor bolts) shall not be repaired, replaced or field-modified without the approval of the project Structural Engineer of Record.
 - (ii) Prior to the erection of a column, the controlling constructor shall provide written notification to the steel erector if there has been any repair, replacement or modification of the anchor rods (anchor bolts) of that column.

8. Beams and Columns

(a) General:

(i) During the final placing of solid web structural members, the load shall not be released from the hoisting line until the members are secured with at least two bolts per connection, of the same size and strength as shown in the erection drawings, drawn up wrench-tight or the equivalent as specified by the project Structural Engineer of Record, except as specified in paragraph (b) of this section.

(ii) Before erection, a qualified person shall determine if more than two bolts are necessary between beams and columns to ensure the stability of cantilevered members: If additional bolts are needed, they shall be installed.

(b) Diagonal bracing: Solid web structural members used as diagonal bracing shall be secured by at least one bolt per connection drawn up wrench-tight or the equivalent as specified by the project Structural Engineer of Record.

(c) Double connections at columns and/or at beam webs over a column:

(i) When two structural members on opposite sides of a column web, or a beam web over a column, are connected sharing common connection holes, at least one bolt with its wrench-tight nut shall remain connected to the first member unless a shop-attached or field-attached seat or equivalent connection device is supplied, with the member to secure the first member and prevent the column from being displaced (See Appendix F to this code for examples of equivalent connection devices).

(ii) If a seat or equivalent device is used, the seat (or device) shall be designed to support the load during the double connection process. It shall be adequately bolted or welded to both a supporting member and the first member before the nuts on the shared bolts are removed to make the double connection.

(d) Column splices. Each column splice shall be designed to resist a minimum

eccentric gravity load of 300 pounds (138.2 kg) located 18 inches (.46 m) from the extreme outer face of the column in each direction at the top of the column shaft.

9. Open Web Steel Joists

(a) General:

(i) Except as provided in paragraph (a)(ii) of this section, where steel joists are used and columns are not framed in at least two directions with solid web structural steel members, a steel joist shall be field-bolted at the column to provide lateral stability to the column during erection.

(ii) Where constructability does not allow a steel joist to be installed at the column:

(1) an alternate means of stabilizing joists shall be installed on both sides near the column and shall:

[A] provide stability equivalent to paragraph (a) of this section;

[B] be designed by a qualified person;

[C] be shop installed; and

[D] be included in the erection drawings.

(2) hoisting cables shall not be released until the seat at each end of the steel joist is field-bolted and the joist is stabilized.

(iii) Where steel joists at or near columns span more than 60 feet (18.3 m), the joists shall be set in tandem with all bridging installed unless an alternative method of erection, which provides equivalent stability to the steel joist, is designed by a qualified person and is included in the site-specific erection plan.

(iv) A steel joist or steel joist girder shall not be placed on any support structure unless such structure is stabilized.

(v) When steel joist(s) are landed on a structure, they shall be secured to prevent unintentional displacement prior to installation.

10. Steel Erection

(a) All joists over 12.2 m (40ft) in length shall be bolted to the supporting structure, unless construct ability does not allow.

(b) All joists over 13.7 m (45ft) in length and less than 18.3 m (60 ft) in length shall have at least one row of X-bridging.

(c) All joists over 18.3 m (60 ft) in length shall have all bridging be X-bridging, and at least 2 rows of bridging shall be installed prior to removing hoist cables.

(d) All joists 12.2 m (40 ft) and longer shall be attached to the structure at both ends where construct ability allows, prior to releasing the hoisting cables.

(e) Joists of less than 12.2 m (40 ft) which are not bolted shall be attached to the structure on both ends prior to the completion of the shift when they are hoisted into place.

(f) All joists of 27.4 m (90 ft) or more in length shall be installed in accordance with the engineer's instruction, which shall be clearly shown on the erection diagrams.

(g) All specialty joists such as bow strings, scissor joists, barrel joists etc., shall be installed in accordance with the engineer's instructions, which shall be clearly shown on the erection diagrams.

(h) Where any joist is bottom chord-bearing, one row of X-bridging shall be provided and installed at or near the bearing point prior to the hoisting cables being released. The

bridging is in addition to any bridging required under previous clauses in section 10.

- (i) When bolted bridging is required by this section the following shall apply:
 - (i) The bridging shall be indicated on the erection drawing;
 - (ii) The erection drawing shall be the exclusive indicator of the proper placement of this bridging;
 - (iii) Shop-installed bridging clips or functional equivalents shall be used where the bridging bolts to the steel joists; and
 - (iv) Bridging attachments shall not protrude above the top chord of the steel joist.

- (j) **Landing and placing loads:**
 - (i) During the construction period, the employer placing a load on steel joists shall ensure that the load is distributed so as not to exceed the carrying capacity of any steel joist.
 - (ii) Except for paragraph (k) of this section, no construction loads are allowed on the steel joists until all bridging is installed and anchored and all joist-bearing ends are attached.

- (k) **On Multi story structures a bundle of joist bridging may be placed on steel joists prior to the installation of required bridging under the following conditions:**
 - (i) A structural engineer has documented that the placing of the bridging bundle does not affect the structural integrity of the structure;
 - (ii) The weight of a bundle of joist bridging shall not exceed a total of 1000 pounds (454 kg);
 - (iii) The bundle of joist bridging shall be placed on a minimum of three steel joists that are secured; and,
 - (iv) The edge of the bridging bundle shall be positioned within 1 foot (.30 m) of either a beam line or the building perimeter.

11. Systems-Engineered Metal Buildings

- (a) All of the requirements of this code apply to the erection of systems-engineered metal buildings (except column anchorage) and open web steel joists.
- (b) Each structural column shall be anchored by a minimum of four anchor rods (anchor bolts).
- (c) Rigid frames shall have 50 per cent of their bolts or the number of bolts specified by the manufacturer (whichever is greater) installed and tightened on both sides of the web adjacent to each flange before the hoisting equipment is released.
- (d) Construction loads shall not be placed on any structural steel frame work unless such framework is safety bolted, welded or otherwise adequately secured.
- (e) In girt and eave strut-to-frame connections, when girts or eave struts share common connection holes, at least one bolt with its wrench-tight nut shall remain connected to the first member unless a manufacturer-supplied, field-attached seat or similar connection device is present to secure the first member so that the girt or eave strut is always secured against displacement.
- (f) Both ends of all steel joists or cold-formed joists shall be fully bolted and/or welded to the support structure before:
 - (i) Releasing the hoisting cables;
 - (ii) Allowing an employee on the joists; or
 - (iii) Allowing any construction loads on the joists.

(g) Purlins and girts shall not be used as an anchorage point for a fall arrest system unless written approval is obtained from a qualified person.

(h) Purlins may only be used as a walking/working surface when installing safety systems after all permanent bridging has been installed and fall protection is provided.

(i) Construction loads may be placed only within a zone that is within 8 feet (2.5m) of the centre-line of the primary support member.

12. Falling Object Protection

(a) Securing loose items aloft: All materials, equipment and tools that are not in use while aloft, shall be secured against accidental displacement.

(b) Protection from falling objects other than materials being hoisted: The controlling constructor shall bar other construction processes below steel erection unless overhead protection for the employees below is provided. Steel erectors will cease work activity until aforementioned protection is in place.

13. Custody of Fall Protection Systems

Fall protection provided by the steel erector may remain in the area where steel erection activity has been completed. It shall not be used by other trades, unless the controlling contractor or its authorized representative:

- (a) Has sought and received permission from the steel erector to leave the fall protection in place; and
- (b) Has inspected and accepted control and responsibility of the fall protection prior to authorizing persons other than steel erectors to work in the area.
- (c) Is aware of the design and limitations of the system and communicated same to any user.

14. Training

In addition to training in this code of practice, the following provisions supplement the requirements outlined within:

- (a) Training personnel: Training required by this section shall be provided by a qualified person(s).
- (b) Supervisors: In addition to required compliance training, supervisors will be trained in basic leadership skills including inspection, investigation, communication, discipline, and hazard identification and control.
- (c) Fall Protection training: The employer shall ensure all employees who may be exposed to fall hazards are provided with adequate fall protection training. The program shall include training and instruction in the following areas:

- (i) The recognition and identification of fall hazards in the work area;
- (ii) The use and operation of guardrail systems (including perimeter safety cable systems), personal fall arrest systems, positioning device systems, fall restraint systems, safety net systems and other protection to be used;
- (iii) The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;
- (iv) The procedures to be followed to prevent falls to lower levels, and through or into holes and openings in walking/working surfaces and walls; and
- (v) The fall protection requirements of this code of practice.

(d) Special training programs: In addition to the training required in paragraphs (a) and (b) of this section, the employer shall ensure workers are competent when engaged in the following activities:

- C Operation of power elevated work platforms
- C Operation of industrial lift trucks
- C Use of crane supported or industrial work truck supported work platforms
- C Use of scaffolding, including but not limited to metal scaffolds, rolling scaffolds, suspended scaffolds or cantilevered scaffolds.
- C Temporary workplace traffic control
- C Any other reasonable training required to ensure the health and safety of persons at the workplace.

Where employers are required to designate an employee competent for specific function i.e operation of industrial lift truck, an appropriate record shall be maintained.

Appendix A

Guidelines for establishing the components of a site-specific erection plan

Non-mandatory guidelines for complying with Part 4(e).

Section 83 of the NS OH&S Act outlines a provision to permit deviation from a requirement of regulation:

“**83 (1)** Where an application is made in writing to the Director for authorization to deviate at a workplace or workplaces from a provision of the regulations, unless the standard to be used by the Director in considering an application is altered by regulation, the Director may authorize the deviation where the Director is satisfied that the deviation affords protection for the health and safety of employees equal to or greater than the protection prescribed by the regulations from which the deviation is requested. A written application must be made to the Director for a deviation. December 5, 1996.”

The OH&S Act Reference Guide offers detail on the required time frame for posting. It offers the following:

“ The application must be posted in the workplace for 28 days before the Director can make a decision on the application. If the application is made prior to the establishment of the workplace, the application must be published 28 days prior to the Director making a decision. December 5, 1996 The 28 day period can be waived where the committee, safety representative or, where neither of those exist, all employees, agree to waive the notice period. December 5, 1996.”

Please refer to Section 83 of the NS OH&S Act for additional detail.

Overview of A Site Specific Erection Plan

- (a) General: This appendix serves as a guideline to assist employers who elect to develop a site-specific erection plan.

- (b) Development of a site-specific erection plan: Pre-construction conference(s) and site inspection(s) are held between the erector and the controlling constructor, and others such as the project engineer, worker representatives and fabricator before the start of steel erection. The purpose of such conference(s) is to develop and review the site-specific erection plan that will meet the requirements of this section.

- (c) Components of a site-specific erection plan. In developing a site-specific erection plan, a steel erector considers the following elements:
 - (i) The sequence of erection activity, developed in coordination with the controlling contractor, that included the following:
 - (1) Material deliveries:

 - (2) Material staging and storage; and

 - (3) Coordination with other trades and construction activities.

 - (ii) A description of the crane and derrick selection and placement procedures, including the following:
 - (1) Site preparation;

 - (2) Path for overhead loads; and

 - (3) Critical lifts, including rigging supplies and equipment.

(iii) A description of steel erection activities and procedures, including the following:

- (1) Stability considerations requiring temporary bracing and guying;
- (2) Erection bridging terminus point;
- (3) Anchor rod (anchor bolt) notifications regarding repair, replacement and modifications;
- (4) Columns and beams (including joists and purlins);
- (5) Connections;
- (6) Decking; and
- (7) Ornamental and miscellaneous iron.

(iv) A decision of the fall protection procedures that will be used to comply with provincial regulations.

(v) A description of the procedures that will be used to comply with Part 12.

(vi) A description of the special procedures required for hazardous non-routine tasks.

(vii) A certification for each employee who has received training for performing steel erection operations.

(viii) A list of the qualified and competent persons.

(ix) A description of the procedures that will be utilized in the event of rescue or emergency response.

- (d) Other plan information. The plan:
 - (i) Includes the identification of the site and project; and
 - (ii) Is signed and dated by the qualified person(s) responsible for its preparation and modification.

Appendix B

Safety Plan

For a project manager, a “**Safety Plan**” provides a blueprint or checklist to ensure the appropriate controls exist to ensure against loss and also ensure compliance with OH&S legislation. The role of a project manager is to communicate, co-ordinate and control.

Contents may vary from project to project; however the following elements should be contained in all safety plans:

Policies - All policies relevant to OH&S and related legislation. These include Safety Policy, PPE Policy, Inspection Policy, Investigation Policy, OH&S Meetings and the Site Safety Rules and applicable Enforcement Policy.

Hazard Assessment(s) - A Project Hazard Assessment should be undertaken by the constructor responsible for the actual work activity and all major subtrades. Hazards and Critical Tasks are identified. Control measures will be identified and all applicable safe work practices and job procedures will be submitted as part of the plan.

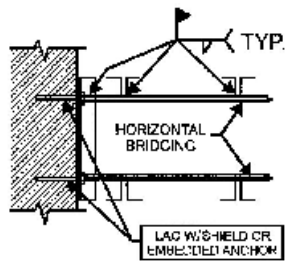
Communications - A strategy to address the necessary information flow on the work site must exist. All parties on the work site must participate and the project manager should ensure that he/she receives verification that OH&S requirements are being met.

Emergency Plan - An emergency plan must take into consideration all potential problems or situations which might arise during the life of the project. An effective plan will promote a timely response in the event of disaster. Consideration must be given to:

- C medical emergencies
- C fire or explosions
- C flooding
- C environmental disasters

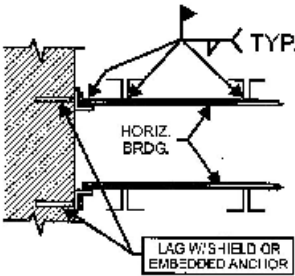
Specific procedures, and contact names and numbers should be clearly identified.

Appendix C
Illustrations of bridging terminus points
(non-mandatory)

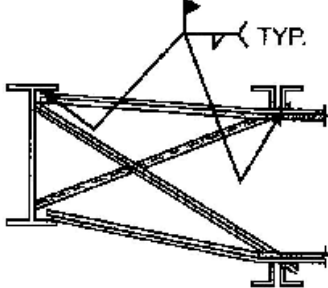


Horizontal Bridging
Terminus At Wall

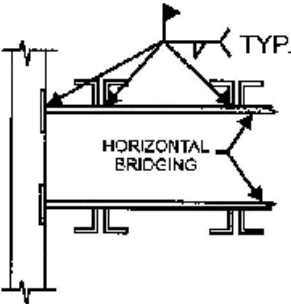
Appendix C



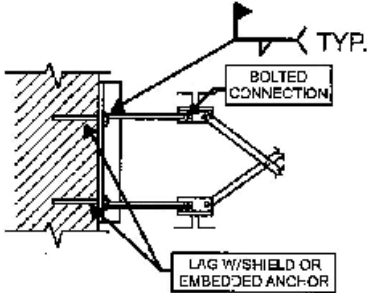
Horizontal Bridging Terminus At Wall



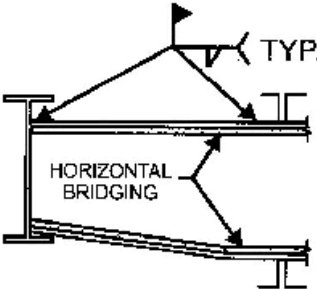
Horizontal Bridging Terminus At Structural Shape With Optional "X-Bridging"



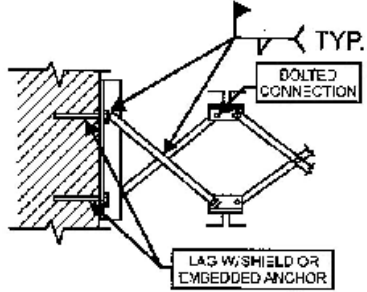
Horizontal Bridging Terminus At Panel Wall



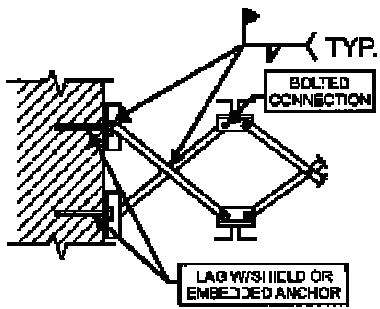
Bolted Diagonal Bridging Terminus At Wall



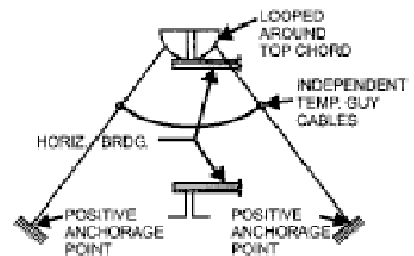
Horizontal Bridging Terminus At Structural Shape



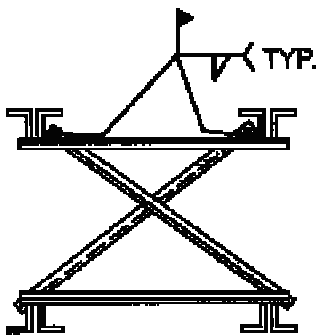
Bolted Diagonal Bridging Terminus At Wall



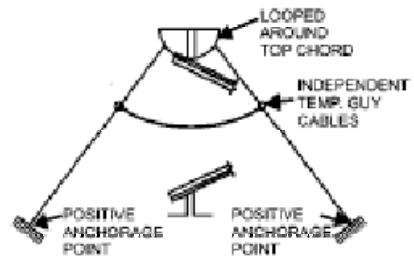
**Bolted Diagonal Bridging
Terminus At Wall**



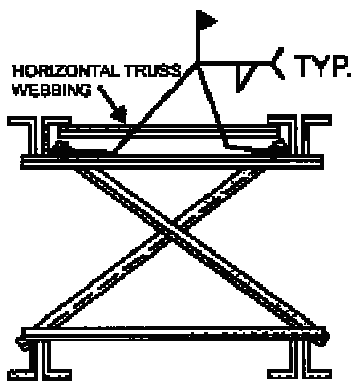
**Horizontal Bridging
Terminus Point Secured
By Temp. Guy Cables**



**Joists Pair Bridging
Terminus Point**



**Diagonal Bridging
Terminus Point Secured
By Temp. Guy Cables**



**Joists Pair Bridging
Terminus Point With
Horizontal Truss**

Appendix D

Training

Non-mandatory guidelines for complying:

The training requirements of this Code of Practice will be deemed to have been met (a competent person) if employees have completed training courses on steel erection and fall protection. Steel erection training must encompass instruction in the provisions of this standard or an equivalent standard that has been approved by NS Environment and Labour.

Appendix E

Perimeter columns

Non-mandatory guidelines for complying to protect the unprotected side or edge of a walking/working surface:

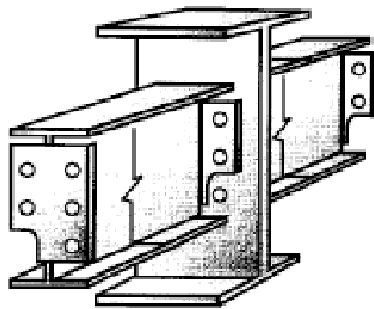
In multi-story structures, when holes in the column web are used for perimeter safety cables, the column splice must be placed sufficiently high so as not to interfere with any attachments to the column necessary for the column splice. Column splices are recommended to be placed at every other or fourth levels as design allows.

Appendix F

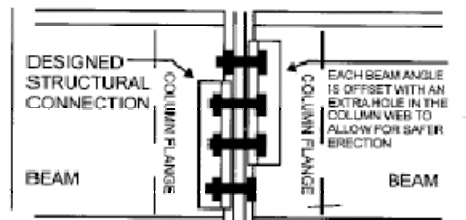
Double connections: illustration of a clipped-end connection and a staggered connection

Non-mandatory guidelines for complying with Part 8(c)(i):

Clipped-end connections are connection material on the end of a structural member which has a notch at the bottom and/or top to allow the bolt(s) of the first member placed on the



opposite side of the central member to remain in place. The notch(es) fit(s) around the nut or bolt head of the opposing member to allow the second member to be bolted up without removing the bolt(s) holding the first member.



Staggered connections are connection material on a structural member in which all of the bolt holes in the common member web are not shared by the two incoming members in the final connection. The extra hole in the column web allows the erector to maintain at least a one bolt connection at all times while making the double connection.

Appendix G
Excerpts From:

made under Section 82 of the
Occupational Health and Safety Act

S.N.S. 1996, c. 7

O.I.C. 1999-195 (April 28, 1999, effective May 1, 2000*), N.S. Reg. 44/99

as amended up to O.I.C. 2004-14 (January 23, 2004), N.S. Reg. 4/2004

(*except as otherwise noted)

Part 1 - Title and Definitions

(g) "competent person" means a person who is

(i) qualified because of that person's knowledge, training and experience to do the assigned work in a manner that will ensure the health and safety of every person in the workplace, and

(ii) knowledgeable about the provisions of the Act and regulations that apply to the assigned work, and about potential or actual danger to health or safety associated with the assigned work;

Part 7 - Hoists and Mobile Equipment

General provisions

55 An employer shall ensure that a hoist, industrial lift truck or powered mobile equipment is erected, installed, assembled, started, operated, used, handled, stored, stopped, inspected, serviced, tested, cleaned, adjusted, maintained, repaired, modified and dismantled in accordance with the manufacturer's specifications, or the specifications certified by an engineer.

Section 55 amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

56 An employer shall ensure that a hoist, industrial lift truck or powered mobile equipment

(a) is operated by a designated competent person;

(b) has gears and moving parts securely guarded by adequate means where necessary to prevent a hazard to a person in the workplace; and

(c) has any load on it adequately secured where necessary to prevent a hazard to a person in the workplace; and

(d) is provided with safe means of access and exit from the operator's position and any passenger's position.

Signaller

57 (1) An employer shall designate one or more competent persons as a signaller to direct the safe movement of a load, hoist, industrial lift truck or powered mobile equipment where the operator of that hoist, industrial lift truck or powered mobile equipment

(a) does not have an adequate view of the load;

(b) does not have a clear view of the route the load is to take;

(c) is not able to see clearly around the equipment when moving and has not taken measures sufficient to ensure that no person is exposed to a hazard as a result of the movement of equipment;

(d) is not able to see clearly where the hoist or its load may encroach the minimum distance specified in Section 126 or a hoist is positioned closer than the length of its boom to an overhead energized power line or power line equipment; or

(e) is causing the equipment to move under its own power from one location to another and the situation creates a hazard in the workplace.

Subsection 57(1) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(2) A signaller shall

(a) be readily identifiable to the operator;

(b) direct the movement of a load or equipment by a well understood distinctive code of hand signals or another effective communication system;

(c) warn the operator each time

(i) any part of the hoist or its load may encroach on the minimum distance specified in Section 126, or

(ii) the hoist is positioned closer than the length of its boom from an overhead energized power line or power line equipment; and

(d) obtain the assistance of another signaller if all or part of the view of the load or route is obstructed from both the signaller and the operator.

(3) An operator of a hoist, industrial lift truck or powered mobile equipment in a situation referred to in subsection (1) shall move a load only on a signal from a signaller.

Safety equipment and precautions

58 An employer shall ensure that a mobile crane, industrial lift truck or powered mobile equipment is equipped with

- (a) an audible back-up alarm that
 - (i) operates automatically when the vehicle is in reverse gear, and
 - (ii) is clearly audible above the background noise at the workplace, or that another means of protection or warning that provides an equivalent level of safety is used;
- (b) a manually operated horn, unless such a horn was not installed at the time of manufacture;
- (c) adequate front and rear lights when the equipment is used after dark or in dimly lit areas;
- (d) an adequate braking system; and
- (e) a screen, shield, grill, deflector, guard or other adequate protection for the operator, where the operator may be exposed to the hazard of flying or intruding objects.

Subsection 58(1) renumbered Section 58 and amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

59 An employer shall ensure that a hoist or powered mobile equipment that is equipped with outriggers or stabilizers is operated with the outriggers or stabilizers engaged, unless the manufacturer's specifications permit otherwise.

Section 59 replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

60 An employer shall ensure that a hoist, industrial lift truck or powered mobile equipment is not altered in such a way as to render ineffective a safety device or control, except where the change has been certified in writing by the manufacturer or an engineer to afford protection equal to or greater than the protection afforded by the original safety device or control.

61 An employer shall take adequate precautions to ensure that a hoist, industrial lift truck or powered mobile equipment does not tip or roll over.

Overhead protection

62 (1) Where an employee who is an operator of powered mobile equipment is exposed to a hazard from falling objects, an employer shall ensure that the powered mobile equipment is equipped with a protective structure adequate for the conditions in which the equipment is being used and that meets the requirements of the applicable SAE standard listed below or that is certified by an engineer or the manufacturer to provide equivalent or better protection:

(a) SAE J167 APR92, "Overhead Protection for Agricultural Tractors - Test Procedures and Performance Requirements";

(b) International Organization for Standardization (ISO) 3449:1992, "Earth-moving machinery — Falling-object protective structures — Laboratory tests and performance requirements";

Clause 62(1)(b) replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

(c) SAE J397 OCT95, "Deflection Limiting Volume - Protective Structures Laboratory Evaluation";

(d) SAE J1042 JUN93, "Operator Protection for General-Purpose Industrial Machines"; or

(e) SAE J1084 APR80, "Operator Protective Structure Performance Criteria for Certain Forestry Equipment".

Clause 62(1)(e) replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

Clause 62(1)(f) repealed: O.I.C. 2000-130, N.S. Reg. 52/2000.

Subsection 62(1) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(2) An employer shall ensure that modifications, alterations or repairs made to a falling objects protective structure that affect the structural integrity of the structure meet the requirements of this Section and that the designing agency, the installing agency or an engineer certifies that modifications, alterations or repairs meet the requirements of this Section.

(3) An employer shall ensure that welding on a falling objects protective structure that affects the structural integrity of the structure is performed by a designated competent person.

Rollover protection

63 (1) An employer shall ensure that, where reasonably practicable, powered mobile equipment and industrial lift trucks manufactured on or after January 1, 1974, are equipped with rollover protective structures that meet the minimum safety requirements of

the following standards:

(a) CSA standard B352.0-95, "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial and Mining Machines - Part 1: General Requirements", or is certified by an engineer or the manufacturer to provide equivalent or better protection;

(b) where applicable, CSA standard B352.1-95 (R1999), "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines - Part 2: Testing Requirements for ROPS on Agricultural Tractors", or is certified by an engineer or the manufacturer to provide equivalent or better protection; and

(c) where applicable, CSA standard B352.2-95 (R1999), "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines - Part 3: Testing Requirements for ROPS on Construction, Earthmoving, Forestry, Industrial, and Mining Machines", or is certified by an engineer or the manufacturer to provide equivalent or better protection.

Subsection 63(1) replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

(2) Where reasonably practicable, an employer shall ensure that powered mobile equipment or industrial lift trucks manufactured before January 1, 1974 are equipped with rollover protective structures that meet the requirements of subsection (1) or

(a) a rollover protective structure and supporting attachments are designed, fabricated and installed in such a manner to support not less than twice the weight of the equipment, based on the ultimate strength of the material and integrated loading of the supporting members with the resultant load applied at the point of impact;

(b) there is a vertical clearance of 1320 mm between the deck and the rollover protective structure at the access openings; and

(c) the rollover protective structure and supporting attachments referred to in clause (a) are certified as meeting the requirements of clause (a) by the manufacturer of the rollover protective structure, the installing agency or an engineer.

Subsection 63(2) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(3) An employer shall ensure that modifications, alterations or repairs made to a rollover protective structure that affect the structural integrity of the structure meet the requirements of this Section and that the designing agency, the installing agency or an engineer certifies that modifications, alterations or repairs meet the requirements of this Section.

[Note: Section 63 and amendments to it made by O.I.C. 2000-130, N.S. Reg. 52/2000 effective November 1, 2000.]

64 An employer shall ensure that welding on a rollover protective structure that affects the structural integrity of the structure is performed by a designated competent person.

[Note: Section 64 effective November 1, 2000.]

65 (1) An employer shall ensure that powered mobile equipment and industrial lift trucks that have been fitted with rollover protective structures have

(a) seat belts for the operator and passengers that comply with or exceed the applicable SAE standard listed below:

(i) SAE J386 NOV97, "Operator Restraint System for Off-Road Work Machines",

Subclause 65(1)(a)(i) replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

(ii) SAE J800 JUN94, "Motor Vehicle Seat Belt Assembly Installation"; or

(b) where the wearing of seat belts is not reasonably practicable, restraining devices such as shoulder belts, bars, gates, screens or other similar devices designed to prevent the operator and passengers from being thrown outside the rollover protective structure.

Subsection 65(1) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(2) An operator of and passengers on powered mobile equipment or an industrial lift truck shall use the seat belts or restraining devices referred to in subsection (1) while the equipment is in motion.

Subsection 65(2) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

[Note: Section 65 and amendments to it made by O.I.C. 2000-130, N.S. Reg. 52/2000 effective November 1, 2000.]

Glass

66 An employer shall ensure that glazing or rigid plastic materials used as part of an enclosure for a cab, canopy or rollover protective structure on a hoist, industrial lift truck or powered mobile equipment is adequate in the circumstances where it is used, and is immediately replaced if it presents a hazard, including permanent interference with visibility.

Precautionary arrangements

67 (1) Unless otherwise authorized by an enactment, no person shall operate an industrial lift truck or powered mobile equipment with passengers on the truck or equipment, unless the manufacturer's specifications for the truck or equipment state that the truck or equipment is designed to accommodate them safely.

Subsection 67(1) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(2) An employer shall ensure that powered mobile equipment and industrial lift trucks that have an internal combustion engine are provided with fire protection equipment adequate for the hazards of the equipment or vehicles.

Subsection 67(2) replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

(3) An employer shall

(a) ensure that mirrors or other devices are installed and maintained at blind intersections where there may be a danger of a collision between an industrial lift truck or powered mobile equipment and another object or a person; or

(b) adopt a written procedure that provides an equivalent level of safety.

Visibility

68 Where work with a hoist, industrial lift truck or powered mobile equipment is carried out in an area where dust may create a hazard to a person in the workplace because of poor visibility, an employer shall take steps to reduce the amount of dust in the air so as to protect a person from the risk of injury.

Operating precautions

69 An operator of a mobile crane, where applicable, an industrial lift truck or powered mobile equipment shall

(a) not set equipment in motion until all air and hydraulic pressures are fully built up at specified operating pressures;

(b) when leaving the equipment unattended

(i) park it on level ground, if reasonably practicable,

(ii) set the parking brake,

(iii) lower the blades, bucket or other attachment or safely block the attachment,

(iv) where applicable, disengage the master clutch, and

(v) shut off the engine or take other precautions to ensure the equipment is not inadvertently set in motion;

(c) not carry containers of gasoline, diesel oil or other flammable substances, classified as Class B substances under the *Hazardous Products Act* (Canada), in the part of the equipment where a person rides; and

(d) ensure that there are no loose articles that may present a hazard in the part of

the equipment where a person rides.

Section 69 amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

70 (1) An employer shall ensure that a hoist, industrial lift truck or powered mobile equipment that has wire ropes, drums and sheaves is inspected

(a) visually on a daily basis by the operator of the equipment; and

(b) visually and manually by a designated competent person on a weekly basis.

(2) An employer shall ensure that, where a person works under a hoist, industrial lift truck, or powered mobile equipment that is raised from the ground, the equipment is provided with blocking or other adequate means of support in case the means of lifting the equipment fails.

71 Where repair or maintenance work is carried out at the point of articulation on an articulated truck, front end loader or other articulated equipment, an employer shall ensure that lock bars or an equivalent measure is used to prevent movement of either end of the truck, loader or equipment.

Hoists

72 (1) Subject to subsection (2), an employer shall ensure that a hoist is designed, installed, erected, examined, inspected, tested, operated and maintained by a competent person, in accordance with the applicable CSA or ANSI standard listed below:

(a) CSA standard B167-96, "Safety Standard for Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists, and Trolleys";

(b) CSA standard C22.2 No. 33-M1984 (R1992), "Construction and Test of Electric Cranes and Hoists";

Clause 72(1)(b) replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

(c) CSA standard Z150-1998, "Safety Code for Mobile Cranes";

(d) CSA Standard Z248-1975, "Code for Tower Cranes";

(e) ANSI standard ANSI/ALI ALCTV-1998, "Automotive Lifts - Safety Requirements for Construction, Testing and Validation";

Clause 72(1)(e) replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

(f) ANSI standard ANSI/ALI ALOIM-1994, "American National Standard for

Automotive Lifts - Safety Requirements for Operation, Inspection and Maintenance".

Section 72 renumbered subsection 72(1) and amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(2) Despite subsection (1), a "crane inspector" described in the standard referred to in clause (1)(a) shall not require 10 000 hours of experience.

Subsection 72(2) added: O.I.C. 2000-130, N.S. Reg. 52/2000.

[Note: Section 72 and amendments to it made by O.I.C. 2000-130, N.S. Reg. 52/2000 effective November 1, 2000.]

73 (1) In this Section and Section 74, "rated load" means the maximum load that a hoist is designed to lift or the revised maximum load that a hoist can lift in accordance with subsection (9) or (10).

Subsection 73(1) replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

(2) Subject to subsections (3), (9) and (10), an employer shall obtain a statement of the rated load of a hoist from the manufacturer of the hoist.

Subsection 73(2) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(3) Where the statement referred to in subsection (2) cannot be obtained, an employer shall obtain a statement of the rated load of the hoist from an engineer.

Subsection 73(3) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(4) In addition to any inspection under Section 72, an employer shall ensure that

(a) a competent person inspects a hoist at least once a year;

(b) where the hoist is a mobile or overhead crane with a capacity of greater than 5t, a certificate from an engineer is obtained on an annual basis with respect to the mobile or overhead crane; or

(c) where the hoist is a tower crane, a certificate from an engineer is obtained with respect to the tower crane

(i) prior to the tower crane being put into service and each time it is erected, and

(ii) once during each year of operation.

(5) An inspection or a certification required under subsection (4) shall confirm that a hoist has a rated load identified and that no component will fail within its rated load.

Subsection 73(5) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(6) The competent person inspecting a hoist under clause (4)(a) and an engineer certifying a mobile or overhead crane under clause (4)(b) or a tower crane under clause (4)(c) shall

perform the appropriate tests to ensure that the hoist is capable of lifting its rated load, including, where appropriate, a running test, load test, deflection test and brake test.

Subsection 73(6) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(7) An employer shall post a legible statement of the rated load referred to in subsection (2) or (3) on a hoist so that the operator of the hoist is able to see it when operating the hoist.

Subsection 73(7) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(8) The employer shall ensure that an operator of a hoist has sufficient information to determine the load that the hoist is capable of hoisting safely under any operating condition.

(9) Where part of a hoist is modified, extended, altered or repaired so as to potentially affect the rated load of the hoist, an employer shall obtain a revised statement of the rated load of the hoist from the manufacturer, if the manufacturer performed the work, otherwise from an engineer, and post it on the hoist in the manner described in subsection (7).

Subsection 73(9) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(10) Where an employer believes that a reduction in the rated load is warranted or has been informed by the manufacturer of the hoist or an engineer that a reduction in the rated load is warranted, the employer shall

(a) obtain a revised statement of the rated load of the hoist from the manufacturer or an engineer;

(b) reduce the rated load of the hoist to a revised level certified as adequate by the manufacturer or an engineer; and

(c) remove the statement of rated load from the hoist and post the revised statement of rated load on the hoist in the manner described in subsection (7).

Subsection 73(10) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(11) Where the employer has obtained a revised statement of the rated load of a hoist pursuant to subsections (9) or (10), the employer shall provide sufficient information to the operator of the hoist to enable the operator to determine the load that the hoist is capable of hoisting safely under any operating condition.

Subsection 73(11) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

[Note: Section 73 and amendments to it made by O.I.C. 2000-130, N.S. Reg. 52/2000 effective November 1, 2000.]

74 (1) Subject to subsection (2), the operator of a hoist shall not subject the hoist to a load in excess of its rated load.

Subsection 74(1) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

(2) At the time that tests are performed for purposes of an inspection or certification, the

person inspecting the hoist may cause the hoist to be subject to a load in excess of its rated load, but not in excess of the safety factor identified by

- (a) the applicable standard in Section 72 or the manufacturer's specifications; or
- (b) where there is no standard or manufacturer's specifications, the specifications certified by an engineer.

Subsection 74(2) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

75 (1) In addition to any inspections referred to in Sections 72 or 73, an employer shall ensure that a competent person visually inspects a hoist, including any safety devices, for defects that may affect the structural integrity of the hoist

- (a) before it is put into service initially or after 1 month or more of disuse;
- (b) once during every month of operation; and
- (c) after any incident or repair, including contact with an energized utility line or equipment that may have damaged some part of the hoist or endangered any person.

(2) Where an inspection identifies a defect in a hoist that affects the safe operation of the hoist, an employer shall remove the hoist from service and repair it before it is put back into service.

(3) An employer shall maintain a record of

- (a) each inspection of a hoist required under Sections 72 and 73, and subsection (1); and

Clause 75(3)(a) amended: O.I.C. 2000-130, N.S. Reg. 52/2000.

- (b) each repair potentially affecting the structural integrity of a component of a hoist that supports a load, including the date, time, nature and results of the inspection or repair and the name of the person who performed the inspection or repair to a hoist.

(4) Where limit switches and safety devices are installed on a hoist by the manufacturer, an employer shall ensure that these switches and devices are maintained in adequate condition.

[Note: Section 75 and amendments to it made by O.I.C. 2000-130, N.S. Reg. 52/2000 effective November 1, 2000.]

76 An operator of a hoist shall

- (a) visually inspect the hoist on a daily basis before use to verify that it is in adequate working order;
- (b) not carry a load over any person, except where
 - (i) it is not reasonably practicable to divert the traffic route of persons or use another lifting route, and
 - (ii) the employer has developed a written work procedure to provide adequate warning or information about the hazard to people at or near the work place;
- (c) not leave a suspended load unattended; and
- (d) where an uncontrolled swing or uncontrolled rotation of a load may endanger the health or safety of a person, ensure that a guide rope or other adequate means is used to stabilize the load.

Mobile cranes

77 An employer shall ensure that a mobile crane has

- (a) installed and maintained in an adequate condition a device that warns the mobile crane operator when continued movement may cause the load attached to a mobile crane to strike the upper sheaves of the mobile crane; and
 - (b) if equipped with a boom that is not articulating, a boom angle indicator.
- Section 77 replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.**

78 An employer shall ensure that barriers or equivalent means are used to prevent a person from entering within the swing radius of the body of the mobile crane where a mobile crane is being operated in an area where the clearance between any obstruction and the swing radius of the body of the mobile crane creates a hazard.

79 While a mobile crane is moving from one location to another under its own power, no operator shall permit the boom to swing in an uncontrolled manner.

Rigging hardware

80 (1) In this Section, "rigging hardware" means a chain, cable, webbing, bucket, grapple, hook, ring, sling or other device used to attach a load to a hoist.

(2) Every inspection required to be performed under this Section shall be performed by a

competent person.

(3) Subject to subsection (4), an employer shall ensure that rigging hardware is constructed, installed, operated, inspected and maintained in accordance with the applicable ASME standard listed below:

- (a) ASME B30.9-1996, "Slings";
- (b) ASME B30.10-1993, "Hooks"; or
- (c) ASME B30.20-1999, "Below-the-Hook Lifting Devices".

(4) Where none of the standards referred to in subsection (3) apply, an employer shall ensure that the rigging hardware complies with an adequate design certified by an engineer.

(5) Where rigging hardware is commercially manufactured, in addition to the requirements of subsection (3) or (4), an employer shall ensure that rigging hardware is constructed, installed, operated, inspected and maintained in accordance with the manufacturer's specifications.

(6) In addition to any inspection required under subsection (5), an employer shall ensure that a person inspects the rigging hardware before each use to ensure that no defect exists that may affect its structural integrity.

(7) In addition to the requirements of subsections (5) and (6), an employer shall ensure that a person inspects the rigging hardware

- (a) before it is put into initial service or after one month or more of disuse; and
- (b) once during every year that it is in operation.

(8) Where the competent person conducting an inspection referred to in subsections (3), (5), (6) or (7) identifies a defect that may affect the structural integrity of the rigging hardware, an employer shall ensure that the rigging hardware is removed from service until such time as it is repaired.

(9) An employer shall maintain a record of

- (a) the inspections referred to in subsections (3), (5) and (7); and
Clause 80(9)(a) amended: O.I.C. 2004-14, N.S. Reg. 4/2004.
- (b) any repairs to rigging hardware.

(10) The record referred to in subsection (9) shall include the date, time, nature and results of the inspection or repair and the name of the person who performed the inspection or repair.

(11) An employer shall identify the safe lifting capacity of rigging hardware on the device in a permanent and clearly legible manner.

(12) An employer shall ensure that a person using rigging hardware receives adequate training and other information sufficient to ensure that they are knowledgeable about the capacity of the rigging hardware.

(13) An employer shall designate a competent person to use rigging hardware.

(14) Before a load is raised by a hoist, an employer shall ensure that a competent person ensures that the load is secured to the hoist in an adequate manner by means of appropriate rigging hardware.

Section 80 replaced: O.I.C. 2000-130, N.S. Reg. 52/2000.

Industrial lift trucks

81 An employer shall ensure that an industrial lift truck

(a) is designed, installed, erected, examined, inspected, operated and maintained in accordance with the applicable ASME standard listed below, where applicable,

(i) ASME B56.1-1993, "Safety Standard for Low Lift and High Lift Trucks", or

(ii) ASME B56.6-1992, "Safety Standard for Rough Terrain Forklift Trucks";

(b) in addition to any inspection required by clause (a), is inspected at the beginning of each shift in which it is used to ensure it is in a safe working condition.

82 (1) An employer shall ensure that an industrial lift truck is not operated

(a) where propelled by an internal combustion engine, in a building or other enclosed structure where adequate ventilation, monitoring and record keeping practices are not carried out so as to eliminate the hazards from exhaust gases; and

(b) near an area containing airborne dust or flammable vapour in a concentration that may cause an explosion; or

(c) in a manner that may endanger a person.

(2) An employer shall ensure that where an industrial lift truck is operated

(a) in a one-way aisle, the width of the aisle equals at least the width of the vehicle or load being carried, whichever is wider, plus 600 mm; and

(b) in a two-way aisle, the width of the aisle equals at least twice the width of the vehicle or load being carried, whichever is wider, plus 900 mm.

- (3) An employer shall ensure that an industrial lift truck that is propelled by propane
- (a) has all engine and fuel components designed, assembled, examined, inspected, operated and maintained in accordance with Part 13 of the Canadian Gas Association standard CAN/CGA - B149.2 - M95, "Propane Installation Code"; and
 - (b) has the components that are propane appliances and equipment repaired and maintained by a designated competent person.

83 Where an industrial lift truck is used with a fork lift platform for lifting a person, the employer shall ensure that

- (a) the industrial lift truck is inspected by an engineer at least once in the preceding 12 months to determine its adequacy for the purpose; and
- (b) the engineer provides a written report certifying the results of the inspection.

Part 13 - Premises and Building Safety, Construction and Demolition

Bracing and supports

154 (1) An employer at a project shall ensure that

- (a) work is completed on any component designed to support or give added support to a part of the project before proceeding with any work that adds to the load on that part;
- (b) a free standing wall of brick, concrete blocks or similar materials greater than 2 m in height is braced from both sides until the wall is attached to a rigid structure and the mortar has set adequately;
- (c) a free standing wall or structure designed to support roof components or any load is braced in an adequate manner to prevent collapse of the wall or structure; and
- (d) a column is erected in an adequate manner to prevent collapse of the column and, where further support is required to ensure that the column does not collapse, braced in an adequate manner.

(2) An employer at a project shall use bracing or shoring for support beneath floor levels where concrete is being poured.

(3) An employer at a project shall

- (a) ensure that bracing or shoring is designed by an engineer and is erected, maintained and dismantled in accordance with the engineer's certified specifications; or

(b) retain the bracing or shoring at all floor levels beneath the floor where concrete is being poured until the removal of the bracing or shoring is authorized in writing by an engineer.

(4) An employer shall ensure that any bracing or shoring referred to in this Section complies with CSA standard CSA S.269.1-1975, "Falsework for Construction Purposes."

(5) An employer shall ensure that footings for shoring and bracing are designed to support the maximum load likely to be imposed, without excessive settlement or deformation.

Appendix H

Fall Protection and Scaffolding Regulations

made under Section 82 of the
Occupational Health and Safety Act
S.N.S. 1996, c. 7
O.I.C. 96-14 (January 3, 1996), N.S. Reg. 2/96

Table of Contents

Part I: General

Citation and application

Interpretation

- (1) Duties of workplace parties
- (2) Measurements of lumber
- (3) Inconsistencies with incorporated standards

Part II: Fall protection

- (4) Fall protection required
- (5) Fall arrest systems
- (6) Guardrails
- (7) Personnel safety nets
- (8) Debris nets
- (9) Safety belts
- (10) Temporary flooring
- (11) Risk of drowning
- (12) Building shafts
- (13) Roof work

Part III: Scaffolds and work platforms

- (14) Use and loading of scaffolds

- (15) Materials to be used in work platforms
- (16) Work platforms: design and construction
- (17) Scaffolds: design and construction generally
- (18) Scaffolds: capacity, access and egress, and fittings
- (19) Inspections and supervision by competent person
- (20) Professional engineer's certification
- (21) Protection from falling objects
- (22) Scaffold stability and movement
- (23) Metal scaffolds
- (24) Rolling scaffolds
- (25) Pumpjack scaffolds
- (26) Suspended scaffolds
- (27) Permanent powered suspension work platforms
- (28) Bracket scaffolds

Roofing brackets

- (29) Fork-lift platform
- (30) Cantilevered scaffolds
- (31) Power operated elevating work platforms
- (32) Crane supported work platforms
- (33) Lifting in certain equipment prohibited

Part I: General

Citation and application

- 1** These regulations may be cited as the Fall Protection and Scaffolding Regulations.
- 2** These regulations apply to all workplaces to which the Occupational Health and Safety Act applies.

Interpretation

- 3**
 - (a)** "Act" means the Occupational Health and Safety Act;
 - (b)** "ANSI" means the American National Standards Institute;
 - (c)** "anchor point" means a component that is attached to a structure and to which fall protection or scaffold components are secured;
 - (d)** "anti-two blocking device" means a device that warns a person operating a hoisting device that continued movement of the load may cause the load to strike or come into contact with the upper sheaves of the hoisting device;
 - (e)** "approved" means approved by the Nova Scotia Department of Environment and Labour or by an approval agency or authority approved by the Nova Scotia Department of Environment and Labour;
 - (f)** "arborist" means a person trained and employed, in whole or in part, to climb trees for any economic or scientific purpose, including
 - (i)** detection and treatment of disease, infections or infestations,
 - (ii)** pruning, spraying or trimming,
 - (iii)** repairing damaged trees,
 - (iv)** assessing growth or harvesting potential, or

- (v) scientific research;
- (g) "boatswain's chair" means a seat attached to a suspended rope, designed to accommodate one person in a sitting position;
- (h) "bracket scaffold" means a scaffold consisting of a work platform supported by brackets attached to a structural wall;
- (i) "CGSB" means the Canadian General Standards Board;
- (j) "CSA" means the Canadian Standards Association;
- (k) "cantilevered scaffold" means a scaffold with a work platform that is directly attached to components that extend out from a building or a structure;
- (l) "competent person" means a person who is
 - (i) qualified because of that person's knowledge, training and experience to do the assigned work in a manner that will ensure the health and safety of persons in the workplace, and
 - (ii) knowledgeable about the provisions of the Act and the regulations, that apply to the assigned work, and about potential or actual danger to health or safety associated with the assigned work;
- (m) "crane supported work platform" means a work platform suspended from the cable of a hoist or crane;
- (n) "debris net" means a net that is used to catch material and debris which can drop from work areas;
- (o) "fall arrest system" means a system of physical components attached to a person that stops a person during a fall;
- (p) "fall protection" means a harness, net, rope, safety belt, structure or other equipment, or device or means of

- (i) restraining a person who is at risk of falling, or
 - (ii) stopping a person who has fallen;
- (q)** "fork-lift platform" means a work platform supported by an industrial lift truck;
- (r)** "full body harness" means a harness consisting of leg and shoulder straps and an upper back suspension unit that will distribute and reduce the impact force of any fall;
- (s)** "guardrail" means a temporary system of vertical and horizontal members that warn of a fall hazard and reduce the risk of a fall;
- (t)** "heavy duty scaffold" means a scaffold designed to support a uniformly distributed load of 366 kg/m^2 or more;
- (u)** "ladderjack scaffold" means a scaffold erected by means of attaching one or more brackets to one or more ladders to support a work platform;
- (v)** "lanyard" means a flexible line used to secure a person to a lifeline, a static line or a fixed anchor point;
- (w)** "lifeline" means a vertical line attached to a fixed anchor point or a static line and to which a lanyard and a ropegrab are attached;
- (x)** "light duty scaffold" means a scaffold designed to support a uniformly distributed load of not more than 366 kg/m^2 ;
- (y)** "permanent powered suspension work platform" means a powered work platform that is suspended from a suspension mechanism which is a permanent part of a building or structure;
- (z)** "personnel safety net" means a net that is used to catch a person during a fall;
- (aa)** "power operated elevating work platform" means a work platform elevated and lowered by means of a mechanical, hydraulic, pneumatic or other powered mechanism;
- (ab)** "practicable" means physically possible in light of current knowledge and invention;

(ac) "professional engineer" means a person who is a professional engineer within the meaning of the Engineering Professions Act and is competent to do the work being performed;

(ad) "pumpjack scaffold" means a scaffold consisting of a work platform supported by vertical poles and adjustable support brackets;

(ae) "reasonably practicable" means practicable unless the person on whom a duty is placed can show that there is a gross disproportion between the benefit of the duty and the cost, in time, trouble and money, of the measures to secure the duty;

(af) "rolling scaffold" means an assembled scaffold

(i) supported by wheels, and

(ii) moved manually;

(ag) "roofing bracket" means a bracket

(i) that is secured to a sloped roof, and

(ii) to which a work platform is secured;

(ah) "ropegrab" means a mechanical fall-arrest device that

(i) is attached to a lifeline and a lanyard, and

(ii) locks itself immediately on the lifeline in the event of a fall;

(ai) "safe means of access and egress" means equipment or a structure that is built to prevent falls by persons going to or from a work area;

(aj) "safe surface" means an area which

(i) has sufficient size and strength to adequately support a person who falls, and

(ii) is sufficiently horizontal to prevent a further fall by a person who has fallen;

(ak) "safety belt" means a belt worn by a person as a means of fall protection;

(al) "scaffold" means

(i) an elevated work platform, or

(ii) a suspended work platform and the supporting components of the work platform;

(am) "softener" means padding or hoses that are used with a lifeline, suspended scaffold or static line to prevent a rope from being cut or chafed;

(an) "static line" means a rope

(i) that is attached horizontally to two or more fixed anchor points, and

(ii) to which a fall arrest system is attached;

(ao) "suspended scaffold" means a scaffold with a work platform supported by ropes suspended from components cantilevered out from a building or other structure, and includes a swingstage, a boatswain's chair and a multi-point suspended scaffold;

(ap) "swingstage" means a scaffold with a work platform supported by two ropes;

(aq) "temporary flooring" means a horizontal working surface that

(i) is designed to give access to areas that do not have permanent flooring, and

(ii) will prevent a worker from falling;

(ar) "thimble" means a metal insert for the inside of a wire rope eye, used when forming an attachment loop, to prevent wear on the rope;

(as) "wooden carpenter's portable bracket scaffold" means a triangular wooden bracket scaffold with gussets that is attached to a vertical wall when in use and which does not normally have another means of support during use;

(at) "work area" means a location at the workplace at which an employee is, or may be required or permitted to be, stationed and includes a work platform; and

(au) "work platform" means a temporary horizontal working surface that provides access

and support to a person at the workplace.

Duties of workplace parties

4 (1) A specific duty provided for in these regulations does not limit the generality of any other duty contained in the Act or any other regulations in force under the authority of the Act.

(2) A duty or requirement imposed on an employer or an employee pursuant to these regulations applies to a self-employed person, with such modifications as the circumstances require.

Measurements of lumber

5 Measurements of lumber in these regulations are nominal for dressed dimensions, unless rough lumber or dimensions are specified.

Inconsistencies with incorporated standards

6 Where there is an inconsistency between a standard or a manufacturer's specification referred to in these regulations and a requirement of these regulations, the requirement of these regulations shall prevail.

Part II: Fall Protection

Fall protection required

7 (1) Where a person is exposed to the hazard of falling from a work area that is

(a) 3 m or more above the nearest safe surface or water;

(b) above a surface or thing that could cause injury to the person upon contact; or

- (c) above an open tank, pit or vat containing hazardous material,
 - (i) the person shall wear a fall arrest system that includes a full body harness, a lanyard and an anchor point and that otherwise complies with Section 8,
 - (ii) a guardrail shall be provided that meets the requirements of Section 9,
 - (iii) a personnel safety net shall be provided that meets the requirements of Section 10,
 - (iv) temporary flooring shall be provided that meets the requirements of Section 14, or
 - (v) a means of fall protection shall be provided that provides a level of safety equal to or greater than a fall arrest system.

(2) Despite subsection (1)

(a) where a person is entering or exiting a work area by a safe means of access and egress, the requirements of subsection (1) do not apply; and

(b) where work must be performed on or from a vehicle, rail car or other mobile equipment, fall protection is required only where and to the extent reasonably practicable;

(c) where it would not be practical to perform work other than from a ladder and it is not practical for the worker to maintain three points of contact while performing the work, fall protection is required only where and to the extent practical; and

(d) where density of tree branches prevents an arborist from crotching, fall protection is required only where and to the extent practical.

(3) Where a person is exposed to the hazard of falling from a work area that is in a location other than those specified in clauses (1)(a), (b) or (c) and an officer determines that fall protection is required, fall protection shall be used.

Fall arrest systems

8 (1) A fall arrest system shall

(a) be adequately secured to

(i) an anchor point, or

(ii) a lifeline that is

(A) securely fastened to an anchor point, or

(B) attached to a static line that is securely fastened to an anchor point that is capable of withstanding either the maximum load likely to be imposed on the anchor point or a load of 17.8 kN, whichever is greater;

(b) include a lanyard that

(i) is attached to an anchor point or lifeline, where practicable, above the shoulder of the user, and

(ii) complies with CSA Standard Z259.1-1995, "Fall Arresting Safety Belts and Lanyards for the Construction and Mining Industries";

(c) prevent a free fall greater than 1.22 m where

(i) the fall arrest system is not equipped with a shock absorption system that complies with CSA Standard Z259.11-M92, "Safety Belts and Lanyards", and that reduces the shock level of any fall to less than 4 kN; or

(ii) the combined free fall and shock absorbed deceleration distance exceeds the distance between the work area and a safe surface; and

(d) include a full body harness that

(i) is attached to a lanyard,

(ii) is adjusted to fit the user of the harness, and

(iii) complies with CSA Standard Z259.10-M90, "Full Body Harnesses".

(2) A lifeline in a fall arrest system shall

(a) be made of

(i) polypropylene rope with a nominal diameter of at least 16 mm, or

(ii) other durable material that provides at least equal protection to the user as polypropylene rope with a nominal diameter of at least 16 mm;

(b) extend to a safe surface;

(c) be secured at the base to prevent tangling or disturbance of the line;

(d) be securely attached to an anchor point;

(e) be free of knots, lubricants and imperfections;

(f) be free of splices, except as are necessary to connect the lifeline to an anchor point;

- (g) be provided with softeners at all sharp edges or corners to protect against cuts or chafing;
 - (h) be protected from corrosion;
 - (i) be used by no more than one person at a time;
 - (j) comply with CSA Standard Z259.2-M1979, "Fall Arresting Devices, Personnel Lowering Devices and Life Lines";
 - (k) be clearly identified as a lifeline by colour or by another means that provides an equivalent level of safety; and
 - (l) not be used for other purposes.
- (3) Despite clause (2)(a), where a lifeline may be damaged by heat or corrosive material, it shall be made of wire rope that has a diameter of at least 8 mm.
- (4) A ropegrab used in a fall arrest system shall comply with CSA Standard Z259.2-M1979, "Fall Arresting Devices, Personnel Lowering Devices and Life Lines".
- (5) Each component of a fall arrest system, including each lifeline, shall be inspected by a competent person prior to each use to determine whether there are any defective, or otherwise unsafe components and if a defect is observed, no person shall use or permit the use of the system until the defective components are replaced or repaired.
- (6) A fall arrest system that has arrested a fall shall
- (a) be removed from service and inspected by a competent person; and
 - (b) be repaired to the original manufacturer's specifications or destroyed, when a defect is observed.
- (7) A static line shall have a nominal diameter of at least 12.7 mm and shall
- (a) be equipped with vertical supports at least every 9 m;
 - (b) have a maximum deflection, when taut, of no greater than 381 mm for a 9 m span;
 - (c) be equipped with turnbuckles or other comparable tightening device that provides an equivalent level of protection, at the ends of the line;
 - (d) be made of Improved Plow Wire Rope;
 - (e) be equipped with softeners at all sharp edges or corners to protect against cuts or chafing; and
 - (f) be made only of components that are able to withstand either the maximum load likely to be imposed on the components or a load of 8 kN, whichever is greater.
- (8) Despite subsections (1), (2), (3), (4) and (7), a fall arrest system for arborists shall

- (a)** include an approved tree climbing or tree trimming harness or saddle;
- (b)** be adequately secured to
 - (i)** an anchor point, or
 - (ii)** a lifeline that is
 - (A)** securely fastened to an anchor point, or
 - (B)** attached to a static line that is securely fastened to an anchor point;
- (c)** include an approved climbing rope or safety strap;
- (d)** where practicable, include a second approved climbing rope or safety strap that
 - (i)** provides additional stability, and
 - (ii)** back-up fall protection; and
- (e)** be capable of withstanding either the maximum load likely to be imposed or a load of 17.8 kN, whichever is greater.

(9) Arborists shall

- (a)** before climbing,
 - (i)** visually assess the structural stability of the tree,
 - (ii)** select and assess the safest path of ascent, and
 - (iii)** select an appropriate crotch position as a work area;
- (b)** work, wherever practicable, from a crotch position, with a fall arrest system secured to an anchor point above the crotch position;
- (c)** when changing crotch positions, remain secured by a fall arrest system to the anchor point for the previous crotch position until secured by a fall arrest system to the anchor point for the next crotch position;
- (d)** not change crotch positions without selecting the next crotch position in advance;
- (e)** ensure that slack in ropes or lines that are part of the fall arrest system, if any, is
 - (i)** essential to the performance of the work, and
 - (ii)** no greater than is consistent with the safe performance of the work;
- (f)** not climb above the anchor point unless secured by another fall arrest system secured at or above the level of the arborist;
- (g)** not work in crews of less than two, one member of which shall remain on the ground; and

(h) when transferring from a power operated work platform to a tree, remain attached by way of fall arrest system to an anchor point on the platform until secured by way of fall arrest system to an anchor point on the tree.

Guardrails

9 (1) A guardrail shall be provided,

(a) around an uncovered opening in a floor or other surface;

(b) at the perimeter or other open side of

(i) a floor, mezzanine, balcony or other surface, and

(ii) a work area,

where a person is exposed to the hazard of a fall described in subsection 7(1).

(2) A guardrail shall be constructed or installed

(a) with posts that

(i) are spaced at intervals of not more than 2.4 metres, and

(ii) are secured against movement by the attachment of the posts to the structure under construction or that is otherwise being worked on, or by another means that provides an equivalent level of safety;

(b) with a top railing that is between 0.91 and 1.06 m above the surface of the protected working area and that is securely fastened to posts secured in compliance with subclause 9(2)(a)(ii);

(c) with a toe board, securely attached to the posts and the structure to which the posts are secured, extending from the base of the posts to a height of 102 mm; and

(d) with an intermediate railing on the inner side of the posts midway between the top railing and the toe board.

(3) A guardrail consisting of wood shall, in addition to the requirements of subsection (2),

(a) have top and intermediate railings and posts that are at least 51 mm x 102 mm;

(b) have a toe board that is at least 25 mm x 75 mm; and

(c) be made of Number One Grade spruce or other lumber that provides an equivalent level of safety.

(4) A guardrail consisting of wire rope shall, in addition to the requirements of subsection (2),

(a) have wire rope railings that are at least 8 mm thick;

- (b) be identified with high visibility markings placed every 1.5 m on the top railing; and
 - (c) have railings with turnbuckles or other means that provide adequate tension to ensure an equivalent level of protection to that provided by a wooden guardrail.
- (5) A manufactured guardrail may be used in place of a wooden or wire rope guardrail if it provides an equivalent level of protection to that provided by a wooden guardrail.
- (6) No guardrail is required around an opening in a floor or other surface if the opening is covered with fastened planks, plywood or other material where the covering
- (a) is capable of supporting four times the maximum load likely to be imposed;
 - (b) is secured to prevent lateral and upward movement; and
 - (c) is identified by a sign that warns of the potential hazard.

Personnel safety nets

- 10 (1) Where used as a means of fall protection, a personnel safety net shall
- (a) be installed not more than 4.6 m below the work area; and
 - (b) where another means of fall protection meeting the requirements of Section 7 is not used, extend 2.4 m on all sides beyond the work area.
- (2) A personnel safety net shall be manufactured, used, maintained, inspected and stored in accordance with ANSI standard A10.11-1989, "Safety Nets Used During Construction, Repair and Demolition Operations".
- (3) Despite subsection (2),
- (a) a personnel safety net shall be installed and maintained so that the maximum deflection when arresting the fall of a person does not allow any portion of the person to contact another surface;
 - (b) the splice joints that connect two or more safety nets shall be equal or greater in strength to the nets; and
 - (c) there shall be no obstructions or intervening members that may be struck during a fall between the work area and the personnel safety net.

Debris nets

- 11 (1) Where persons having access to an area below an elevated work area are exposed to the

hazard of falling objects from the work area, a debris net, or other means of protection that provides an equivalent level of protection from falling objects and debris, shall be used.

(2) A debris net shall be

(a) manufactured, used, maintained, inspected and stored in accordance with ANSI standard A10.11-1989, "Safety Nets Used During Construction, Repair and Demolition Operations"; and

(b) despite clause (a), installed not more than 4.6 m below the elevated work area.

12 One net may be used for the purpose of a personnel safety net and a debris net if it meets the requirements specified in these regulations for personnel safety nets.

Safety belts

13 A safety belt used as a means of fall protection shall comply with

(a) CSA Standard Z259.1-1995, "Safety Belts and Lanyards; or

(b) CSA Standard Z259.3-M1978, "Lineman's Body Belt and Lineman's Safety Strap".

Temporary flooring

14 (1) Where temporary flooring is used, it shall be installed at each floor level where work is in progress.

(2) Temporary flooring shall,

(a) except for any openings necessary for the carrying out of work, extend over the whole work area;

(b) be able to withstand four times the maximum load likely to be imposed on it; and

(c) be securely fastened to and supported on members that are able to withstand four times the maximum load likely to be imposed.

Risk of drowning

15 (1) A personal floatation device shall comply with CGSB standard CGSB 65.11-M88, "Personal Floatation Devices".

(2) Where a person is exposed to the hazard of falling from a work area and there is a risk of drowning,

(a) a personal floatation device shall be worn where the work area is less than 3 m above

the surface of the water;

(b) rescue equipment shall be provided that includes

- (i) an adequate motor boat to ensure a safe and timely rescue,
- (ii) a life buoy with 15 m of polypropylene rope that is at least 10 mm in diameter or that is made from material that provides an equivalent level of protection,
- (iii) a boat hook,
- (iv) an audible alarm system to notify of an accident and to initiate the rescue procedure; and

(c) persons who are

- (i) designated to perform specific rescue tasks,
- (ii) properly informed as to the proper rescue procedures, and
- (iii) trained in the use of the rescue equipment in order to perform rescue operations safely,

shall be available in such numbers as are needed in the circumstances to perform rescue operations safely.

(3) Where work is being done above water that has a fast current and where practicable, a line shall be placed across the water

(a) that is made of polypropylene rope that is 10 mm in diameter or material that provides an equivalent level of protection; and

(b) that has buoys or some other floatation device attached.

(4) For greater certainty, subsection (2) does not apply where persons are protected by fall protection in accordance with subsection 7(1).

Building shafts

16 Where there is no work platform installed at the level of a doorway or opening in a building shaft, the guardrail that is installed in accordance with these regulations shall be marked with a warning sign that indicates the presence of an open building shaft.

Roof work

17 (1) Where work is being done from or near the edge of a roof that has a slope of less than 3/12 in circumstances described in subsection 7(1), fall protection shall be provided, in accordance with Section 7.

- (2) Where work is being done from or on a roof that has a slope that is greater than or equal to 3/12 but less than 6/12, under circumstances described in subsection 7(1), a fully decked scaffold or roof brackets and planks shall be installed at the base of the roof.
- (3) Where work is being done from a roof that has a slope that is greater than or equal to 6/12 but less than 9/12, under circumstances described in subsection 7(1), roof brackets and planks shall be installed as work progresses on the roof.
- (4) Where work is done from the edge of a roof that has a slope that is greater than or equal to 3/12 but less than 9/12, under circumstances described in subsection 7(1), then in addition to the requirements of subsection (2) or (3), a fully decked scaffold work platform or a fall arrest system shall be used.
- (5) Where work is done from or on a roof that has a slope greater than or equal to 9/12, under circumstances described in subsection 7(1), a fully decked scaffold work platform, roof brackets with planks and a fall arrest system shall be provided in accordance with these regulations.

Part III: Scaffolds and Work Platforms

Use and loading of scaffolds

- 18 (1) Where work cannot be performed in a safe manner from the ground or other safe surface, a scaffold or other means of support that provides an equivalent level of safety shall be provided.
- (2) No scaffold shall be
 - (a) loaded in excess of its rated capacity; or
 - (b) operated or supplied in the absence of the manufacturer's specification or the professional engineer's design required by these regulations; or
 - (c) used to support a ladder or other structure or device for the purpose of increasing the scaffold's working height or area.
- (3) Ladderjack scaffolds and wooden carpenter's portable bracket scaffolds are prohibited in all workplaces.

Materials to be used in work platforms

- 19 A work platform shall consist of
 - (a) wooden planks that are
 - (i) No. 1 grade or better spruce that are 51 mm thick rough and 254 mm wide rough,

- (ii) free of decay, large knots, splits, warps or other defects, and
 - (iii) not painted so as to prevent the identification of possible defects; or
- (b)** a commercially manufactured platform of equivalent strength to the wooden planks described in clause (a).

Work platforms: design and construction

20 (1) A work platform shall be

- (a)** designed, constructed and maintained to support, without exceeding the allowable unit stresses for the materials used, four times the maximum load likely to be imposed on the work platform;
- (b)** 458 mm or more in width; and
- (c)** securely fastened in place so as to prevent movement by cleating or wiring or such other means of fastening as provides an equivalent level of safety.

(2) Where a platform is made of planks, each plank in the platform shall

- (a)** extend at least 152 mm and not more than 305 mm beyond the supporting members; and
- (b)** be laid flat with an overlap at each end of 305 mm with a plank in any adjoining platform, with the centre of the overlap directly over a supporting member; and
- (c)** be of the same length where
 - (i) it is practical, and
 - (ii) work platforms are linked.

Scaffolds: design and construction generally

21 A scaffold erected from the ground or other safe surface shall be

- (a)** erected plumb and level;
- (b)** constructed with vertical supports that
 - (i) rest upon a firm footing that can support the maximum load of the scaffold without unsafe settlement or deformation, or
 - (ii) where there is no firm footing, rest upon mud sills that prevent unsafe settlement, deformation or tipping;
- (c)** constructed of components that are adequately secured to prevent lateral movement

and in any event, by at least one tie for each

(i) 4.6 m vertical interval, and

(ii) 6.4 m horizontal interval;

(d) braced diagonally in the vertical and horizontal planes to prevent lateral movement, except that one diagonal brace may be removed where other comparable precautions are taken to ensure the stability of the scaffold;

(e) installed and constructed by a competent person to secure the scaffold against lateral movement where the scaffold is enclosed;

(f) constructed of vertical supports and bearers that are no greater than 3 m apart.

Scaffolds: capacity, access and egress, and fittings

22 Every scaffold shall

(a) be capable of supporting at least four times the maximum load likely to be imposed;

(b) have a safe means of access and egress; and

(c) be provided with fittings and gear that comply with the manufacturer's specifications or a professional engineer's design.

Inspections and supervision by competent person

23 (1) Every scaffold shall be inspected by a competent person each day prior to use, for defects, damage, deterioration or loosening that may affect its strength and if such defect, damage, deterioration or loosening is found, the scaffold shall not be used until repaired or, where necessary, replaced.

(2) The erection and dismantling of every scaffold shall be supervised by a competent person.

Professional engineer's certification

24 (1) The design of a scaffold used in the workplace shall be certified by a professional engineer, where

(a) the scaffold is a pumpjack scaffold that is greater than 9.75 m in height, and has one or more members that are not commercially manufactured for the purpose for which they are used;

(b) the scaffold is a wooden scaffold that is greater than 9.75 m in height;

- (c) the scaffold is a suspended scaffold that
 - (i) has one or more supporting members that are not commercially manufactured for the purpose for which they are used,
 - (ii) is used in a manner that exceeds the manufacturer's rated load, or
 - (iii) has two work platforms that are
 - (A) linked, or
 - (B) tiered on one suspended scaffold;

- (d) the scaffold is a cantilevered scaffold that
 - (i) extends more than 1.22 m from the edge of the bearing surface, or
 - (ii) has an inboard portion of an outrigger, from the fulcrum point to the anchor point, that is less than 1.5 times the length of the outboard portion of the outrigger;

(e) the scaffold is greater than 15 m above the foundation on which it is based;

(f) the scaffold is a crane supported work platform with one or more supporting members that are not commercially manufactured for the purpose for which they are used;

(g) the scaffold is a fork-lift platform with one or more supporting members that are not commercially manufactured for the purpose for which they are used; or

(h) an officer determines that extraordinary conditions, including, but not limited to, wind and elevation conditions, require a professional engineer's certified design to ensure the adequacy of the scaffold.

- (2) Where a professional engineer's certified design of a scaffold is required, the scaffold shall be erected, used, maintained and dismantled in accordance with the certified design.
- (3) Where a professional engineer's certified design of a scaffold is required, an officer may request a professional engineer's certification that a scaffold has been erected and maintained in accordance with the certified design.

Protection from falling objects

25 Where work is being performed on a scaffold above a work area to which access is not restricted, persons below shall be protected from the hazard of objects falling from the scaffold by

- (a) overhead protection;

- (b) the tying of tools and other unsecured objects on the scaffold; or
- (c) other means that provide an equivalent level of safety to overhead protection.

Scaffold stability and movement

- 26 (1)** Subject to clause 36(11)(e), where work is being done from a scaffold, the scaffold shall not be moved horizontally while
- (a) a person; or
 - (b) unsecured tools, material or equipment, are on the scaffold.
- (2)** No work shall be done from a scaffold during erection or dismantling of the scaffold unless
- (a) the work area on the scaffold complies with these regulations; or
 - (b) the persons performing the work are protected by a means of fall protection that complies with these regulations.
- (3)** To prevent tipping, a free standing scaffold that is at least three times higher than its minimum base dimension shall be equipped with guy wires, outrigger stabilizers or such other means of support that provide an equivalent level of safety.
- (4)** A scaffold shall not be used when there is a severe weather condition which may create a hazardous situation.

Metal scaffolds

27 A metal scaffold shall,

- (a) subject to clause (b), be erected, used, maintained and dismantled in accordance with the manufacturer's specifications, or in accordance with a professional engineer's design that includes instructions on erection, use, maintenance and dismantlement;
- (b) despite clause 21(c) and (d), be braced diagonally in the vertical plane, at every level and on each side, and in the horizontal plane, at every 4.6 m;
- (c) have components that are securely fastened with locking mechanisms, as designed by the manufacturer or a professional engineer, both during erection and otherwise; and
- (d) be equipped with screwjacks where necessary to ensure that the scaffold is plumb and level.

Rolling scaffolds

28 (1) A rolling scaffold shall

(a) be equipped with

(i) suitable braking and locking devices, and

(ii) a mechanism that, when applied, secures the wheels of the scaffold; and

(b) be assembled

(i) with horizontal cross-bracing starting at the base and at 4.6 m vertical intervals, and

(ii) from components that are securely fastened with locking mechanisms, as designed by the manufacturer or a professional engineer, during assembly.

(2) The braking and locking devices and the securing mechanism referred to subsection (1) shall be applied prior to and while a person is using the scaffold.

(3) A rolling scaffold shall not be moved on an inclined surface unless adequate precautions are taken to prevent tipping, sliding, acceleration or any other dangerous or sudden movement.

Pumpjack scaffolds

29 (1) A pumpjack scaffold made of metal shall not be more than 13.7 m in height, and shall be braced every 4.6 m, starting at the base of the scaffold.

(2) A pumpjack scaffold that includes one or more supports made of wood, shall not be more than 7.3 m in height and shall be braced every 3 metres, starting at the base of the scaffold.

(3) A pumpjack scaffold may be used as a light duty scaffold only and is not to be used by more than two people at one time.

(4) Every pumpjack scaffold must be erected, used, maintained and dismantled according to the manufacturer's specifications, or in accordance with a professional engineer's design that includes instructions on erection, use, maintenance and dismantlement.

Suspended scaffolds

30 (1) If a suspended scaffold is commercially manufactured, it shall be erected, used, maintained and dismantled in accordance with the manufacturer's specifications.

(2) If a suspended scaffold is not commercially manufactured, it shall be

- (a) operated in accordance with written operating procedures that are to be developed by the employer; and
 - (b) erected, used, operated and maintained in accordance with a professional engineer's design that includes instructions on erection, use, maintenance and dismantlement.
- (3) Unless a suspended scaffold is a boatswain's chair, it shall be suspended by at least two upper attachments placed so that the suspension ropes are parallel.
- (4) Every suspended scaffold shall, during use, be tied to an outrigger, or, where an outrigger is impractical, a parapet clamp.
- (5) When not in use, a suspended scaffold shall be lowered to the ground or lashed to the structure to which it is attached.
- (6) No suspended scaffold shall be moved up or down during use if the work platform of the scaffold is more than 10% out of level.
- (7) Where a safe means of access and egress is not otherwise provided, a powered suspended scaffold shall be equipped with a controlled descent device, other than a lifeline, for use in the event of a mechanical or power failure, that can be safely operated from the work platform and can move the scaffold to a point of safe egress.
- (8) Power units on a suspended scaffold shall be equipped with
 - (a) positive pressure controls; and
 - (b) positive drivesfor raising and lowering the scaffold.
- (9) A manually operated suspended scaffold shall be equipped with a hoisting mechanism that has a secondary locking device that is securely locked in a positive drive position.
- (10) Where two suspended work platforms are tiered on one suspended scaffold, the upper platform shall have at least two independent means of support arranged so that the failure of one support will not result in the collapse of the upper platform.
- (11) Subject to clause (18)(a), all supporting members of a suspended scaffold, including outriggers, parapet clamps, anchor points, parapet and work platform[s] must be able to withstand four times the maximum load likely to be imposed on them.
- (12) Counterweights on a suspended scaffold must
 - (a) be securely attached to the outriggers;
 - (b) consist of solid material; and
 - (c) be of sufficient weight to counterbalance four times the rated capacity of the scaffold.

- (13)** Where the outrigger of a suspended scaffold does not have an eye bolt, it shall be equipped with a positive stop device at the outer end of the outrigger that prevents the movement of the rope.
- (14)** Outriggers on a suspended scaffold shall
- (a)** have printed on each component; or
 - (b)** [have] otherwise accessible to the user,
- the maximum load that may be imposed on the component.
- (15)** An outrigger used in a suspended scaffold shall not be made of wood or include components made of wood.
- (16)** Any outrigger or parapet clamp used on a suspended scaffold shall be tied to an anchor point so as to prevent movement of the outrigger or clamp.
- (17)** Where an outrigger on a suspended scaffold consists of more than one component, the components must be fastened and held together by at least two independent fastening and connecting systems so as to prevent the components from separating.
- (18)** A rope used to suspend a work platform shall
- (a)** be able to withstand ten times the maximum load likely to be imposed on the rope;
 - (b)** where made of wire, not be less than 7.8 mm in diameter;
 - (c)** where made of polypropylene, not be less than 16 mm in diameter; and
 - (d)** in the case of a scaffold that can be moved upward and downward,
 - (i)** extend to the nearest safe surface, and
 - (ii)** be secure from tangling or fouling.
- (19)** A fall arrest system, including a ropegrab and an independent life line, shall be used by all persons working on or from a suspended scaffold, and by all persons entering onto or leaving a suspended scaffold.
- (20)** Despite subsection (19), where a suspended scaffold has more than one means of support on each side of the work platform, either of which would prevent collapse of the scaffold in the event of the failure of the other, a fall arrest system that is attached to an adequate anchor point on the platform may be used.
- (21)** Despite subsection (19), where the suspended scaffold has more than one means of support on each side of the work platform, either of which would prevent displacement of the work platform and falls by persons on the work platform in the event of the failure of the other, persons need not use a fall arrest system.
- (22)** Where work is performed on a suspended scaffold, the work area below the platform

shall

(a) be roped off, barricaded or provided with a means of overhead protection; and

(b) have highly visible warning signs posted to notify people of the overhead hazard.

(23) All suspension lines, tiebacks, lifelines and other supporting components of a suspended scaffold that are made of rope, shall be protected from abrasions, corrosive substances, other foreign materials, heat or work activities that might damage the rope or internal hoist mechanisms.

Permanent powered suspension work platforms

31 (1) A permanent powered suspension work platform shall

(a) be installed, designed, constructed and maintained to perform safely any task required; and

(b) be certified as safe for use by a professional engineer

(i) after installation, and

(ii) thereafter, at least once per year.

(2) Written safe working procedures shall be developed by the employer for the users of each permanent powered suspension work platform.

(3) Every person using a permanent powered suspension work platform shall be trained in the proper use of the platform.

Bracket scaffolds

32 A bracket scaffold shall

(a) not have brackets more than 3 m apart; and

(b) be securely attached to the wall so as to prevent dislodging.

Roofing brackets

33 Roofing brackets shall

(a) be erected and maintained to support four times the maximum load that is likely to be imposed on the brackets;

(b) be securely nailed to the roof; and

(c) have a span of no more than 3 m.

Fork-lift platform

34 (1) An industrial lift truck shall not be used to lift a fork-lift platform where

(a) the ground or other conditions at a workplace may affect the stability of the fork-lift platform; or

(b) the industrial lift truck is susceptible to tipping, displacement or other destabilization.

(2) A fork-lift platform shall

(a) be erected, used, maintained and dismantled in accordance with the manufacturer's specifications, or in accordance with a professional engineer's design that includes instructions on erection, use, maintenance and dismantlement;

(b) be equipped with guardrails;

(c) be securely attached to an industrial lift truck during use;

(d) be operated at all times by a competent person, who shall be continuously at the controls where the platform is in an elevated position; and

(e) be only used on a firm, flat surface that ensures the stability of the industrial lift truck, unless otherwise specified by the manufacturer.

(3) Where a fall arrest system is required by these regulations on a fork-lift platform, it shall be attached to an anchor point on the platform.

(4) Where

(a) a fork-lift platform is in an elevated position; and

(b) a person is on the platform;

the industrial lift truck supporting the work platform shall not be moved horizontally.

Cantilevered scaffolds

35 (1) An outrigger of a cantilevered scaffold shall

(a) not extend more than 1.22 m from the edge of the bearing surface, unless it complies with subclause 24(1)(d)(i);

(b) have an inboard portion, from the fulcrum point to the point of anchorage, not less

than 1.5 times the length of the outboard portion, unless it complies with subclause 24(1)(d)(ii);

(c) be securely braced at the fulcrum point against movement or upsetting;

(d) have inboard ends that are anchored against horizontal and vertical movement, displacement or upset; and

(e) comply with subsections 30(16) and (17), where used on a roof.

(2) A cantilevered scaffold shall not be used as a landing platform for loads deposited by a crane or hoist, unless

(a) fall protection is used; and

(b) a guardrail is placed at the entrance to the platform when the platform is not in use.

(3) A cantilevered scaffold must be equipped with a fully decked work platform.

Power operated elevating work platforms

36 (1) A power operated elevating work platform shall

(a) be equipped with positive pressure controls for the positioning of the work platform;

(b) be equipped with a power elevating mechanism equipped with positive drives for both raising and lowering the work platform;

(c) be equipped with an interlock device that limits lateral movement when the height of the work platform exceeds that specified by the manufacturer;

(d) be equipped with an elevating mechanism that, upon failure, locks the work platform in the elevated position; and

(e) be operated by a competent person at all times during use.

(2) Where an elevating mechanism fails, a person on the work platform shall be removed from the platform before the platform is lowered or repairs are made to the mechanism.

(3) Where the operator of a power operated elevating work platform is not the person being raised on the work platform, there shall be an effective and direct means of communication between the two.

(4) A power operated elevating work platform shall be designed, constructed, erected, maintained, inspected, monitored and used in accordance with the following CSA Standards, as applicable:

(a) CAN3-B354.1-M82, "Elevating Rolling Work Platforms";

(b) CAN3-B354.2-M82, "Self-Propelled Elevating Work Platforms for Use on Paved/Slab

Surfaces";

(c) CAN3-B354.3-M82, "Self-Propelled Elevating Work Platforms for Use as 'Off-Slab' Units";

(d) CAN3-B354.4-M82, "Boom-Type Elevating Work Platforms"; and

(e) CSA C225 M88, "Vehicle Mounted Aerial Device".

(5) The following information shall be readily available and accessible to the operator of a power operated elevating work platform:

(a) all of the applicable operational limitations and requirements, including those relating to the use of outriggers, stabilizers and extendable axles;

(b) the specific surface conditions required for safe use in the elevated position;

(c) such warnings as may be specified by the manufacturer;

(d) the name and number of the National Standards of Canada Standard to which the power operated elevating work platform was designed;

(e) the name and address of the owner; and

(f) a legible operator's manual.

(6) The following information shall be securely posted at the controls of a power operated elevating work platform:

(a) the rated working capacity; and

(b) other than for a boom-type elevating work platform, the direction of the machine movement for each operating control.

(7) The owner of a power operated elevating work platform shall keep a permanent record of all inspections, tests, repairs, modifications and maintenance performed on it.

(8) The record required in subsection (7) shall include the name and signature of the person who performed the inspection, test, repair, modification or maintenance.

(9) An employer shall ensure that a person who operates a power operated elevating work platform has, before using it for the first time,

(a) received oral or written instruction on the safe operation of the particular vehicle; or

(b) otherwise been adequately trained to operate that class of work platform.

(10) The instruction and training required by subsection (9) is to be given by a competent person and must include

(a) instruction in the manufacturer's specifications;

- (b) instruction in applicable load limitations;
 - (c) instruction on the kinds of surfaces on which the power operated elevating work platform is designed to be used; and
 - (d) a hands on demonstration of the proper use of all controls.
- (11) A power operated elevating work platform shall
- (a) not be loaded in excess of its rated working capacity;
 - (b) be used on a firm level surface unless otherwise specified by the manufacturer;
 - (c) be otherwise used only in accordance with the manufacturer's specifications;
 - (d) not be loaded and used in such a manner as to create an unstable condition or cause a hazard; and
 - (e) not be moved vertically or horizontally unless all persons on it are protected against falling by a fall arrest system attached to an anchor point on the work platform.
- (12) Where a person is working on an elevating work platform, a fall arrest system, attached to an anchor point, shall be worn at all times.
- (13) Every power operated elevating work platform shall be equipped with an emergency stop button on the work platform.

Crane supported work platforms

- 37 (1) No work platform may be suspended from a crane or hoist unless the work to be performed cannot be done in a safe and practical manner from a conventional scaffold.
- (2) The design of a hoist used for the suspension of a work platform shall be certified by a professional engineer.
- (3) A crane or hoist used to suspend a work platform shall
- (a) be operational in the power up and power down positions;
 - (b) be equipped with an automatic brake system that operates when the crane is not hoisting or lowering;
 - (c) be equipped with an anti-two block device;
 - (d) operate at a safe lifting and lowering speed; and
 - (e) have at least three full wraps on the hoisting drum at all times.

- (4) The operator of the crane or hoist used to suspend a work platform shall have an effective means of constant communication with the person on the platform.
- (5) A crane supported work platform shall have a secondary means of support, shackled above the ball of the crane, that is able to support the platform if the primary means of support fails.
- (6) A commercially manufactured crane supported work platform shall be erected, used, maintained and dismantled in accordance with the manufacturer's specifications.
- (7) The design of a crane supported work platform that is not commercially manufactured shall be certified by a professional engineer and erected, used, maintained and dismantled according to the design.
- (8) A fall arrest system, attached to an anchor point on the work platform, shall be used by persons working from or otherwise present on a crane supported work platform.

Lifting in certain equipment prohibited

- 38 Except as expressly permitted in these regulations or in some other enactment, persons shall not be lifted or held aloft in equipment, such as loader buckets or backhoes, not specifically designed for that purpose.

References

OSHA Subpart R – Steel Erection 126.750, The United States Department of Labor, Occupational Safety & Health Administration

Occupational Safety General Regulations made under Section 82 of the Occupational Health and Safety Act , S.N.S. 1996, c. 7 O.I.C. 1999-195 (April 28, 1999, effective May 1, 2000*), N.S. Reg. 44/99 as amended up to O.I.C. 2004-14 (January 23, 2004), N.S. Reg. 4/2004

NS Fall Protection and Scaffolding Regulations made under Section 82 of the Occupational Health and Safety Act S.N.S 1996, c. 7 O.I.C. 96-14 (January 3, 1996), N.S. Reg. 2/96