Crane & Hoist Rigging Requirements – Know The Laws of Your Province

There's been an alarming surge in the number of crane accidents across Canada. Among the leading causes of crane accidents—and OHS violations—are faulty rigging practices and rigging equipment. "Rigging" refers to the fibre ropes, wire ropes, chains, slings, attachments, connecting fittings, and other associated components used in a hoisting operation to attach the load being lifted to the crane, hoist, or other device performing the lift. Each province has strict and specific regulations governing the selection, design, operation, inspection, maintenance, and storage of rigging equipment, including:

- Slings.
- Fibre, steel wire, and other ropes.
- Hooks, eye rings, shackles, and other types of rigging hardware.

While specific rules vary, you can rank the jurisdictions in terms of how extensive and strict their rigging requirements are:

- **Tier 1:** BC has Canada's most extensive and stringent OHS rigging rules.
- **Tier 2:** While not at the level of BC, rigging requirements are also very strict in Alberta,

Newfoundland, Ontario, Saskatchewan, Northwest Territories, and Nunavut.

- **Tier 3:** The next tier includes Manitoba, Nova Scotia, Prince Edward Island, Québec, and Yukon where OHS rigging requirements are specific and strict but less extensive than in the Tier 2 provinces and territories.
- **Tier 4:** In sharp contrast, Federal and New Brunswick OHS regulations don't say much about rigging except in a very general way.

Here's a summary of the OHS requirements in all parts of Canada.

FEDERAL

1. Employer must adopt and implement recommendations in Chapter 10 of the National Safety Council of the United States' Accident Prevention Manual for Business and Industry, 10th edition, dated 1992, regarding the use and maintenance of any rope, sling or chain or any attachment or fitting used by an employee (*COHS Regs*, 14.42(1)).
2. **Exception:** The above rule doesn't apply to ropes, slings or chains or to any attachments or fittings that comply with the requirements of the *Tackle Regulations* under the *Canada Shipping Act, 2001* (*COHS Regs*, 14.42(1)).

ALBERTA

1. Employer must ensure that rigging isn't subject to a load of more than:
    - 10% of the breaking strength of the rigging's weakest part, if a worker is being raised or lowered.
    - 20% of the ultimate breaking strength of the rigging's weakest part in all other situations

unless the manufacturer has fatigue rated the rigging in accordance with CEN Standard EN 16771: 2000, *Components for slings – Part 1: Forged steel components, Grade 8.*

- If the rigging is fatigue rated in accordance with CEN EN 16771:2000 and a worker isn't being raised or lowered, the maximum load must not exceed 25% of the ultimate breaking strength (*OHS Code*, Sec. 292(1)).

2. Despite subsection (1), employer may use a dedicated rigging assembly designed and certified for a particular lift or project by a professional engineer, but the dedicated rigging assembly must be re-rated to comply with subsection (1) before it's used for another lift or project (*OHS Code*, Sec. 292(2)).
3. Employer must ensure that rigging components are rated relative to their ultimate breaking strength in accordance with the following safety factors:
    - Running lines: 3.5 to 1;
    - Non-rotating hoist lines: 5 to 1;
    - Tugger lines/blocks for pulling: 3 to 1:
    - Pendant lines/guy lines: 3 to 1; and
    - Winch lines: 2 to 1 (*OHS Code*, Sec. 292.1(1)).
4. Employer must ensure that rigging components or hoisting lines used in any towing operation aren't used for any hoisting operation (*OHS Code*, Sec. 292.1(2)).
5. Employer must ensure that the maximum load rating of the rigging, as determined by the rigging manufacturer or a professional engineer, is legibly and conspicuously marked on the rigging (*OHS Code*, Sec. 293(1)).
6. **Exception:** If it's not practicable to mark the rigging, employer must ensure the maximum load rating of the rigging is available to the workers at the work site (*OHS Code*, Sec. 293(2)).
7. Employer must ensure that rigging to be used during a work shift is inspected thoroughly before each period of continuous use during the shift to ensure that it's

functional and safe (*OHS Code*, Sec. 294).

8. A worker must not use rigging that doesn't comply with (Part 21 of) the *OHS Code* (*OHS Code*, Sec. 295).
9. Employer must ensure that sharp edges on loads to be hoisted are guarded to prevent damage to the rigging's slings or straps (*OHS Code*, Sec. 296).
10. Employer must ensure that wire rope, alloy steel chain, synthetic fibre rope, metal mesh slings, and synthetic fibre slings manufactured on or after July 1, 2009 meet ASME B30.92006, *Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings* (*OHS Code*, Sec. 297(1)).
11. Employer must ensure that below the hook lifting devices, other than slings, meet ASME B30.202006, *BelowtheHook Lifting Devices* (*OHS Code*, Sec. 297(2)).
12. Employer may use a capacity data sheet to label a spreader bar with its rated capacity as long as the employer ensures that the data sheet and corresponding spreader bar are identified by a unique numbering system (*OHS Code*, Secs. 297(3) + (4)).
13. Employer must ensure that synthetic fibre slings are permanently and legibly marked or appropriately tagged with the following:
    - The manufacturer's name or trademark.
    - The manufacturer's code or stock number.
    - The safe working load for the types of hitches permitted.
    - If appropriate, the type and material of construction (*OHS Code*, Sec. 298(1)).
14. Employer must ensure that slings at a worksite aren't subjected to pull tests beyond 100% of their rated load capacity (*OHS Code*, Sec. 298(2)).
15. Employer must ensure that rope on a winding drum is securely fastened to the drum and that the number of wraps of rope remaining at all times on a drum:
    - Complies with the manufacturer's specifications

for the rope and the drum, or
- If there are no manufacturer's specifications, is not less than 5 full wraps (*OHS Code*, Sec. 299).

16. Employer must ensure that U-bolt type clips used for fastening wire rope are installed:
    - So that the Ubolt section of the clip bears on the short or "dead" side of the rope.
    - So that the saddle of a clip bears on the long or "live" side of the rope.
    - Using the number and with the spacing that complies with the specifications in Schedule 5 of the *OHS Code* (*OHS Code*, Sec. 300(1)).
17. Employer must ensure that cable clips used for fastening wire rope are installed and torqued to the manufacturer's specifications or, in the absence of manufacturer's specifications, to the values specified in Schedule 5 (*OHS Code*, Sec. 300(2)).
18. Employer must ensure that double saddle clips (fist clips) used for fastening wire rope are installed using the number and the spacing and torque that complies with the specifications in Schedule 5 (*OHS Code*, Sec. 300(3)).
19. Employer must ensure that double base clips used for fastening wire rope are installed with a spacing that's not less than 6 times the diameter of the rope (*OHS Code*, Sec. 300(4)).
20. If a ferrule is used to form an eye loop in a wire rope and (i) the ends of the splice are visible beneath the ferrule, or (ii) the ferrule is identified as covering a "Flemish eye" splice, the employer must ensure that the ferrule is commercially manufactured of steel and properly swaged onto the splice (*OHS Code*, Sec. 301(1)).
21. Despite Item #20 above, if an aluminum alloy ferrule must be used, employer must ensure that the ferrule is:
    - Commercially manufactured.
    - Identified as being made of aluminum alloy.
    - Properly swaged onto the splice (*OHS Code*, Sec.

301(2)).

22. Employer must ensure that the wire ropes, sheaves, spools and drums used in rigging have a diameter of no less than the diameter specified by the manufacturer for use in that circumstance (*OHS Code*, Sec. 302(1)).
23. Employer must ensure that the rope used in rigging is the correct size for the sheave, spool, or drum over which the rope passes (*OHS Code*, Sec. 302(2)).
24. Employer must ensure that the grooving of wire rope sheaves is the correct size for the wire rope used (*OHS Code*, Sec. 302(3)).
25. Employer must ensure that end fittings and connectors used on a wire rope conform to the manufacturer's specifications as to number, size, and method of installation (*OHS Code*, Sec. 302(4)).
26. Employer must ensure that rigging blocks are constructed and installed so that the ropes can't jump off the sheaves (*OHS Code*, Sec. 302(5)).
27. Employer must ensure that a hook has a safety latch, mousing, or shackle if the hook could cause injury if it's dislodged while in use. **Exceptions:**
    - Employer may use another type of hook if a competent worker disconnecting the hook would be in danger if the hook has a safety latch, mousing or shackle.
    - Employer may use a sorting hook for hoisting a skeleton steel structure or for performing similar operations if a sorting hook is safer to use than a hook with a safety latch, mousing or shackle (*OHS Code*, Secs. 303(1) to (3)).
28. During a hoisting operation in a caisson, employer must not use a spring-loaded safety latch hook, and must use a shackle assembly consisting of a pin fully shouldered into the eyes of the shackle and secured by a nut that's prevented from rotating by a cotter pin (*OHS Code*, Sec. 303(4)).
29. Employer must ensure that rigging doesn't have:

- Makeshift fittings or attachments, including those constructed from reinforcing steel rod, that are load bearing components.
- Rigging and fittings that are repaired by welding unless they're certified safe for use by a professional engineer after the repair is completed.
- Alloy steel chain that's welded or annealed (*OHS Code*, Sec. 304).

30. Employer must ensure that a synthetic fibre web sling is permanently removed from service if it's damaged or worn as follows:
    - The length of the edge cut exceeds the web thickness.
    - The depth of an abrasion is more than 15% of the webbing thickness, taken as a proportion of all plies.
    - The total depth of the abrasion on both sides of the webbing is more than 15% of the webbing thickness, taken as a proportion of all plies.
    - The depth of the warp thread damage is up to 50% of the webbing thickness and the damage either: (i) is within 25% of the sling width of the edge, or (ii) covers 25% of the sling width.
    - The warp thread damage is as deep as the sling is thick: (i) in an area that's within 25% of the sling width of the edge, or (ii) over an area that's more than 12.5% of the width of the sling.
    - Weft thread damage allows warp threads to separate over an area that's wider than 25% of the sling width and longer than twice the sling width (*OHS Code*, Sec. 305(1)).
31. Employer must ensure that a synthetic fibre web sling is permanently removed from service if:
    - Part of the sling is melted, charred, or damaged by chemicals.
    - Stitches in load bearing splices are broken or

worn.
    - End fittings are excessively pitted or corroded, cracked, distorted or broken (*OHS Code*, Sec. 305(2)).
32. Employer must ensure that a synthetic fibre web sling is permanently removed from service if it's damaged in such a way that the total effect of the damage on the sling is approximately the same as the effect of any one of the types of damage referred to in Items #30 or #31 above (*OHS Code*, Sec. 305(3)).
33. Employer must ensure that a synthetic fibre web sling that's permanently removed from service in accordance with the regulations is physically altered to prevent its further use as a sling (*OHS Code*, Sec. 305(4)).
34. Employer must ensure that wire rope is permanently removed from service if:
    - Wear or corrosion affects individual wires over more than 1/3 of the original diameter of the rope.
    - There's evidence that the rope structure is distorted because of bulging, kinking, birdcaging or any other form of damage.
    - There's evidence of heat or arc damage.
    - The normal rope diameter is reduced, from any cause, by more than:
        - 0.4 millimetres if the normal rope diameter is 8 millimetres or less.
        - 1 millimetre if the normal rope diameter is more than 8 millimetres and less than 20 millimetres.
        - 2 millimetres if the normal rope diameter is 20 millimetres or more and less than 30 millimetres.
        - 3 millimetres if the normal rope diameter is 30 millimetres or more (*OHS Code*, Sec. 306(1)).

35. Employer must ensure that a running wire rope is permanently removed from service if either:
    - 6 or more randomly distributed wires are broken in one rope lay; or
    - 3 or more wires are broken in one strand in one rope lay (*OHS Code*, Sec. 306(2)).
36. Employer must ensure that a stationary wire rope such as a guy line is permanently removed from service if either:
    - 3 or more wires are broken in one rope lay in sections between end connections; or
    - More than one wire is broken within one rope lay of an end connection (*OHS Code*, Sec. 306(3)).
37. Employer must ensure that wire rope that doesn't rotate because of its construction is permanently removed from service if:
    - There's evidence of the damage referred to in Item #34 above.
    - 2 randomly distributed wires are broken in 6 rope diameters.
    - 4 randomly distributed wires are broken in 30 rope diameters (*OHS Code*, Sec. 306(4)).
38. Employer must ensure that a metal mesh sling is removed from service if:
    - There's a broken weld or broken brazed joint along the sling edge.
    - A wire in any part of the mesh is broken.
    - Corrosion has reduced a wire diameter by 15%.
    - Abrasion has reduced a wire diameter by 25%.
    - There's a loss of flexibility because the mesh is distorted.
    - The depth of the slot is increased by more than 10% because the choker fitting is distorted.
    - The width of the eye opening is decreased by more than 10% because either end fitting is distorted.
    - The original cross-sectional area of metal is reduced by 15% or more at any point around the

hook opening or end fitting.
- Either end fitting is distorted.
- An end fitting is cracked (*OHS Code*, Sec. 307).

39. Employer must ensure that a component of rigging that's been contacted by an electric arc is removed from service unless a professional engineer certifies that it's safe to use (*OHS Code*, Sec. 308).
40. Employer must ensure that a worn, damaged or deformed hook is permanently removed from service if the wear or damage exceeds the specifications allowed by the manufacturer (*OHS Code*, Sec. 309).

BRITISH COLUMBIA

1. Rigging and slinging work must be done by or under the direct supervision of qualified workers familiar with the rigging and code of signals for controlling hoisting operations (*OHS Regs*, Sec. 15.2).
2. Loads to be unhooked by a worker must be safely landed and supported before the rigging is detached (*OHS Regs*, Sec. 15.3).
3. The load applied to any rigging or rigging assembly must not exceed the working load limit (WLL) (*OHS Regs*, Sec. 15.4(2)).
4. Rigging fittings must be marked with the manufacturer's identification, product identifier and the WLL or sufficient information to readily determine the WLL (*OHS Regs*, Sec. 15.5(1)).
5. The WLL of existing fittings not identified as specified in Item #4 above must be determined by a qualified person, marked on the fitting and such fittings must be removed from service (*OHS Regs*, Sec. 15.5(2)).
6. The design factors based on breaking strengths for rigging components must be at least equal to the values listed in Table 15-1 of the Regulation (except as otherwise specified in the Regulation) (*OHS Regs*, Sec.

15.6(1)).

**Table 15-1 below*

7. The above design factors may be reduced for a dedicated rigging assembly designed and certified by a professional engineer for a specific lift, but the dedicated assembly must be re-rated according to the requirements of Table 15-1 for continued use (*OHS Regs*, Sec. 15.6(2)).
8. The design factor for any rigging assembly used to support workers must be at least 10 (*OHS Regs*, Sec. 15.6(3)).
9. The minimum design factor based on breaking strength for wire rope on a mobile crane, unless otherwise specified by the crane or wire rope manufacturer, is:

    - For conventional wire rope:
        - 2.5 for pendant lines, 3 for boom hoist reeving and 3.5 for load lines, during erection; and
        - 3 for pendant lines, 3.5 for boom hoist reeving and 3.5 for load lines, at all times except during erection, and
    - 5 for wire rope of nonrotating construction (*OHS Regs*, Sec. 15.7).

10. Natural fibre rope must not be used for hoisting with a powered hoist (*OHS Regs*, Sec. 15.8).
11. If a wedge socket is used as a wire rope termination, the dead end of the rope must be secured to prevent release of the wedge or rope slippage at the socket (*OHS Regs*, Sec. 15.9).
12. (1) A hook must have a safety latch or other means that will retain slings, chains, or other similar parts, under slack conditions (*OHS Regs*, Sec. 15.10(1)).
13. A hook used in an application where manipulation of a safety latch or other retaining means may cause a hazard

to a worker or where there is no hazard to a worker if the load becomes dislodged is exempt from the requirements of Item #12 above (*OHS Regs*, Sec. 15.10(2)).

14. A shackle-pin, heel-pin and similar device must be secured against dislodgement and the pin in a screw-pin type shackle must be wired or otherwise secured against rotation when used in applications that may cause the pin to loosen (*OHS Regs*, Sec. 15.11).
15. A shackle-pin must not be replaced with a bolt or other makeshift fitting (*OHS Regs*, Sec. 15.12).
16. A rope must be secured to its winding drum, unless the line is required to automatically disengage from the drum, and must not be fastened to a drum by a knot tied in the rope (*OHS Regs*, Sec. 15.14).
17. At least 2 full wraps of rope must remain on winding drums when the load hook is in the lowest position (*OHS Regs*, Sec. 15.15).
18. Pulling and pulled lines must be connected by a suitable splice, or a cable pulling sock must fully enclose both line ends whenever a worker may be endangered by failure of the connection between the 2 lines while reeving lines through sheaves or blocks (*OHS Regs*, Sec. 15.16).
19. A sheave must:

    - Be correctly sized for the rope.
    - Have a device to retain the rope within the groove.
    - Be removed from service if it has a damaged groove or flange (*OHS Regs*, Sec. 15.17).

20. The strength of each guyline and its anchor must exceed the breaking strength of the load-line rigging arrangement (*OHS Regs*, Sec. 15.18(1)).
21. A guyline anchor must be placed so that the interior angle, between the guyline and horizontal plane, doesn’t exceed 45° (*OHS Regs*, Sec. 15.18(2)).

22. Guylines must be arranged so that the hoisting line pull in any direction is shared by 2 or more guys (*OHS Regs*, Sec. 15.18(3)).
23. **Exceptions:** It's okay for guylines and anchor systems to deviate from the requirements of Items #20, 21, and 22, if they're certified by a professional engineer (*OHS Regs*, Sec. 15.18(4)).
24. Workers must not use their hands or feet or any handheld object to guide the rope when spooling the rope onto a drum. **Exception:** In an emergency a steel guide bar of acceptable design may be used to guide the rope onto the drum, but the line speed must be kept as low as practicable, and the worker must be positioned to be clear of the drum (*OHS Regs*, Sec. 15.19).
25. Where hand signals are used between a signaler and the operator of a crane or hoist to control hoisting operations, the signals shown in Figure 15-1 of the Regulations must be used (*OHS Regs*, Sec. 15.20).
26. The WLL must be reduced in accordance with the efficiency rating for the type of termination specified in Figure 15-2 of the Regulations, unless otherwise permitted by the manufacturer (*OHS Regs*, Sec. 15.21).
27. If the manufacturer's specifications for installing and using wire rope clips can't be determined, the number of clips and the installation torque must be as shown in Table 15-2 of the Regulations (*OHS Regs*, Sec. 15.22(2)).
28. The U-bolt part of a wire rope clip must be installed so that it bears on the unloaded end of the wire rope (*OHS Regs*, Sec. 15.22(3)).
29. Malleable cast iron wire rope clips must not be used for hoisting or other critical applications unless approved by the manufacturer for that purpose (*OHS Regs*, Sec. 15.22(4)).
30. A turnback eye splice made using wire rope clips must use the number of clips specified by the manufacturer for each turnback eye termination, or if not specified

by the manufacturer, specified in Table 15-2 of the Regulations (*OHS Regs*, Sec. 15.23(1)).

31. A lap splice made using wire rope clips must use double the number of clips specified by the manufacturer for a turnback eye termination, or if not specified by the manufacturer, specified in Table 15-2 (*OHS Regs*, Sec. 15.23(2)).
32. A wire rope termination using a swaged fold back eye must be identified with a serial number or other unique identification code, proof tested before being placed in service, and a record of the proof test kept available for the service life of the termination (*OHS Regs*, Sec. 15.24(2)).
33. A swaged fold back eye termination must be identified with the WLL as required by section 15.42 of the Regulations (*OHS Regs*, Sec. 15.24(3)).
34. Wire rope must be permanently removed from service if:

    - In running wire ropes, there are 6 or more randomly distributed wires broken in one rope lay or 3 or more wires are broken in one strand in one lay.
    - In stationary wire ropes, such as guylines, there are 3 or more broken wires in one lay in sections between end connections, or more than one broken wire within one lay of an end connection.
    - Wear, or the effects of corrosion, exceed 1/3 of the original diameter of outside individual wires.
    - There’s evidence of kinking, bird-caging or any other damage resulting in distortion of the rope structure.
    - There’s evidence of heat or arc damage.
    - There are reductions of normal rope diameter, from any cause, in excess of:

        - 0.4 mm (1/64 in) for diameters up to and including 8 mm (5/16 in).

- 1 mm (3/64 in) for diameters greater than 8 mm (5/16 in) up to and including 19 mm (3/4 in).
- 2 mm (1/16 in) for diameters greater than 19 mm (3/4 in) up to and including 29 mm (1 1/8 in).
- 3 mm (3/32 in) for diameters greater than 29 mm (1 1/8 in) (*OHS Regs,* Sec. 15.25).

35. Wire rope with nonrotating construction must be removed from service if:

    - The rejection criteria listed in Item #34 above are met.
    - There are 2 randomly distributed broken wires in 6 rope diameters.
    - There are 4 randomly distributed broken wires in 30 rope diameters (*OHS Regs,* 15.26).

37. A rigging component or a wire rope that's been contacted by an electric arc must be removed from service until certified safe for continued use by a professional engineer (*OHS Regs,* 15.27).
38. Rigging and fittings that have been repaired by welding must not be placed in service until certified safe for continued use by a professional engineer (*OHS Regs,* 15.28(1)).
39. Alloy steel chain must not be welded or annealed (*OHS Regs,* 15.28(2)).
40. A worn or damaged hook must be permanently removed from service if:

    - The throat opening, measured at the narrowest point, has increased by more than 15% of the original opening.
    - The hook has twisted more than 10° from the original plane of the hook.
    - The hook has lost 10% or more of its cross-

sectional area.
- The hook is cracked or otherwise defective.
- Wear or damage exceeds any criteria specified by the manufacturer (*OHS Regs,* 15.29).

40. Unless otherwise required by the Regulations, wire rope, alloy steel chain, metal mesh, synthetic fibre rope, synthetic roundslings, and synthetic fibre web slings must meet the requirements of *ASME B30.9-2006 Slings* (*OHS Regs,* 15.30).
41. Slings and attachments must be visually inspected before use on each shift, and defective equipment must be immediately removed from service (*OHS Regs,* 15.31).
42. Makeshift couplers, shorteners, hooks, or other load bearing attachments for slings, including those made from concrete reinforcing steel, must not be used unless the working load limit has been determined and certified by a professional engineer (*OHS Regs,* 15.32).
43. The determination of the working load limit of a sling assembly must ensure that the WLL of any individual component of the assembly is not exceeded (*OHS Regs,* 15.33(1)).
44. The WLL of a sling with more than 3 legs is limited to the WLL of any 3 legs of the sling (*OHS Regs,* 15.33(2)).
45. The load carried by any single leg of a bridle sling must not be greater than the WLL of the leg (*OHS Regs,* 15.33(3)).
46. If a sling is used to lift at any angle from the vertical, the design factors required by the Regulations must be maintained, and a qualified person or the manufacturer must determine the required reduction of the WLL of the sling, or it must be reduced according to Table 15-3 of the Regulations (*OHS Regs,* 15.33(4)).

**Table 15-3 below*

47. Before being placed in service any new, repaired or altered sling having welded couplers or other welded

load bearing attachments must be proof tested by the manufacturer, or manufacturer's representative or an agency acceptable to the Board in the manner specified by the manufacturer (*OHS Regs,* 15.36).

48. A sling must be stored so as to prevent damage when it's not in use (*OHS Regs,* 15.37).
49. A sling with a knot must not be used (*OHS Regs,* 15.38).
50. When a sling is applied to a sharp edge of a load, the edge or the sling must be protected to prevent damage to the sling (*OHS Regs,* 15.39).
51. A sling must be selected and used to prevent slipping or overstressing the sling or the load (*OHS Regs,* 15.40(1)).
52. A load consisting of 2 or more pieces of material over 3 m (10 ft) long must be slung using a 2-legged sling arrangement positioned to keep the load horizontal during the lift, and each sling must be choked around the load with a double wrap (*OHS Regs,* 15.40(2)).
53. For a multiple piece lift:
    - Each member of the lift that's being delivered to a different spot must be independently slung back to the main load hook or master link using graduated length slings.
    - A lifted member must not support another lifted member.
    - A crane with power-controlled lowering must be used (*OHS Regs,* 15.41).
54. A wire rope sling with a swaged or poured socket or a pressed fitting must be permanently identified with:
    - Its working load limit.
    - The angle upon which the WLL is based.
    - The name or mark of the sling manufacturer (*OHS Regs,* 15.42).
55. A wire rope sling must be permanently removed from service when the applicable rejection criteria listed in Item #34 above are met; A sling with damaged end fittings must not be used (*OHS Regs,* 15.43).

56. Wire rope of nonrotating type construction or of Lang's lay type construction must not be used in a sling (*OHS Regs,* 15.44).
57. A wire core rope sling must not be exposed to or used at a temperature above 205°C (400°F) unless otherwise specified by the manufacturer (*OHS Regs,* 15.45(1)).
58. A fibre core wire rope sling must not be exposed to or used at a temperature above 100°C (212°F) unless otherwise specified by the manufacturer (*OHS Regs,* 15.45(2)).
59. An alloy steel chain sling must be permanently identified with:
    - The size.
    - The manufacturer's grade and WLL.
    - The length and number of legs.
    - The name or mark of the sling manufacturer (*OHS Regs,* 15.46).
60. Chain used for hoisting must be approved by the chain manufacturer for hoisting (*OHS Regs,* 15.47(1)).
61. Proof coil and transport chain must not be used for hoisting (*OHS Regs,* 15.47(2)).
62. A chain sling must be permanently removed from service or repaired by a qualified person to the original manufacturer's specification or to the specifications of a professional engineer if the chain has defects such as stretch or deformation, cracks, nicks or gouges, corrosion pits. or burned links (*OHS Regs,* 15.48).
63. A chain sling must be permanently removed from service when the chain link wear is more than the maximum allowed by the manufacturer; If the manufacturer doesn't specify removal criteria, the chain must be permanently removed from service when the chain size at any point of the link is reduced to the values given in Table 15-4 of the Regulations (*OHS Regs,* 15.49).
64. A chain sling must be thoroughly inspected at least once each year and a record of the inspection must be kept (*OHS Regs,* 15.50).

65. A chain sling must not be exposed to a temperature above 260°C (500°F) unless otherwise permitted by the manufacturer (*OHS Regs,* 15.51)
66. Synthetic fibre web slings must be permanently identified with the:
    - Manufacturer’s name or mark.
    - Manufacturer’s code or stock number.
    - Working load limits for the types of hitches permitted.
    - Type of synthetic web material (*OHS Regs,* 15.52).
67. Synthetic fibre web slings must not be exposed to a temperature above 82°C (180°F) unless otherwise permitted by the manufacturer (*OHS Regs,* 15.53).
68. A synthetic fibre web sling must be removed from service when any of the following circumstances occurs:
    - The length of an edge cut exceeds the web thickness.
    - The penetration of abrasion exceeds 15% of the webbing thickness taken as a proportion of all plies.
    - Abrasion occurs on both sides of the webbing and the sum of the abrasion on both sides exceeds 15% of the webbing thickness taken as a proportion of all plies.
    - Warp thread damage up to 50% of the sling thickness extends to within 1/4 of the sling width of the edge or exceeds 1/4 the width of the sling.
    - Warp thread damage to the full depth of the sling thickness extends to within 1/4 of the sling width of the edge or the width of damage exceeds 1/8 the width of the sling.
    - Weft thread damage allows warp thread separation exceeding 1/4 the width of the sling and extends in length more than twice the sling width.
    - Any part of the sling is melted or charred, or is damaged by acid or caustic.
    - Stitches in load bearing splices are broken or

worn.
- End fittings are excessively pitted or corroded, cracked, distorted, or broken.
- A combination of the above types of damage of approximately equal total effect are present (*OHS Regs,* 15.54).

69. A metal mesh sling must be permanently identified with:
    - The manufacturer's name or mark; and
    - The WLL for vertical basket hitch and choker hitch configurations (*OHS Regs,* 15.55).
70. A metal mesh sling must be removed from service if any of the following damage is visible:
    - A broken weld or a broken brazed joint along the sling edge.
    - A broken wire in any part of the mesh.
    - Reduction in wire diameter of 25% due to abrasion or 15% due to corrosion.
    - Lack of flexibility due to distortion of the mesh.
    - Distortion of the choker fitting so that the depth of the slot is increased by more than 10%.
    - Distortion of either end fitting so that the width of the eye opening is decreased by more than 10%.
    - A 15% reduction of the original cross-sectional area of metal at any point around the hook opening or end fitting.
    - Visible distortion of either end fitting.
    - A cracked end fitting (*OHS Regs,* 15.56).
71. Spreader bars and other specialized below-the-hook lifting devices must be constructed, inspected, installed, tested, maintained, and operated according to the requirements of *ASME B30.20-1993, Below-the-Hook Lifting Devices* (*OHS Regs,* 15.57).
72. Spreader bars and other specialized below-the-hook lifting devices must have their working load limit certified by a professional engineer or established by the lifting device manufacturer (*OHS Regs,* 15.58).
73. A nameplate or other permanent marking must be on a

spreader bar or specialized below-the-hook lifting device and display the:

- Manufacturer's name and address.
- Serial number.
- Weight of the device, if more than 45 kg (100 lbs).
- Working load limit (*OHS Regs,* 15.59).

74. A spreader bar and any other specialized below-the-hook lifting device must be considered part of the lifted load (*OHS Regs,* 15.60).

MANITOBA

1. Employer must ensure that no person rides on a load, hook, rigging, or bucket attached to a crane or hoist (*WSH Regs*, Sec. 23.16).
2. Employer must ensure that rigging meets the applicable requirements of the following standards:

    - ASME B30.26-2015, *Rigging Hardware*.
    - ASME B30.21-2014, *Lever Hoists*.
    - ASME B30.20-2018, *Below-the-Hook Lifting Devices*.
    - ASME B30.9-2018, *Slings*.
    - ASME B30.10-2014, *Hooks*.
    - ASME B30.23-2016, *Personnel Lifting Systems* (*WSH Regs*, Sec. 23.33(1)(a)).

3. Employer must ensure that rigging is assembled, used, maintained, inspected, and dismantled in accordance with the manufacturer's specifications (*WSH Regs*, Sec. 23.33(1)(b)).
4. **Exceptions:** The requirements set out in Items #2 and #3 above don't apply to rigging that's:

    - Designed by a professional engineer in accordance with the requirements of the standards set out in Item #2.
    - Assembled, used, maintained, inspected and

dismantled in accordance with the specifications of the professional engineer (*WSH Regs*, Sec. 23.33(2)).

5. Employer must ensure that a spreader bar is designed and certified by a professional engineer, and constructed, assembled, maintained, inspected, used, and dismantled in accordance with the professional engineer's specifications (*WSH Regs*, Sec. 23.34).
6. Employer must ensure that rigging and spreader bars are:
    - Suitable for and capable of supporting the load being rigged.
    - Capable of supporting at least 5 times the maximum weight of the load which will be or is likely to be imposed.
7. Labelled or marked with their rated load and weight (*WSH Regs*, Sec. 23.35).
8. Employer must ensure that a hook block has its rated load and weight legibly cast or stamped on it in a conspicuous location (*WSH Regs*, Sec. 23.37).

NEW BRUNSWICK

1. Employer must ensure that a competent person carries out the rigging of materials to be hoisted by a hoisting apparatus (*OHS General Regs*, Sec. 207(1.1)).
2. Employer must ensure that a competent person thoroughly inspects and repairs a hoisting apparatus, including any safety devices or rigging equipment before it's first put into use, and after any incident that may have damaged some part of the hoisting apparatus (*OHS General Regs*, Sec. 210(2)).
3. Employer must ensure that a log book recording inspections and repairs to a hoisting apparatus is maintained and made available to a government OHS officer on request (*OHS General Regs*, Sec. 210(3)).

NEWFOUNDLAND & LABRADOR

1. Rigging used to suspend a work platform from a crane or hoist must have a safety factor of at least 10, and must be used exclusively for suspending the work platform (*OHS Regs*, Sec. 194).
2. A worker may not ride on a load, sling, hook, or other rigging equipment (*OHS Regs*, Sec. 325).
3. Rigging and slinging work must be done by or under the direct supervision of a qualified worker familiar with the rigging to be used and with the code of signals for controlling hoisting operations (*OHS Regs*, Sec. 347).
4. The load applied to rigging or a rigging assembly must not exceed the working load limit (WLL) (*OHS Regs*, Sec. 348).
5. Rigging fittings must be marked with the manufacturer's identification, product identifier and the working load limit or sufficient information to readily determine it, as determined by the manufacturer or a professional engineer (*OHS Regs*, Sec. 349).
6. Except as otherwise specified in these regulations, the design factor based on breaking strengths for a rigging component must be at least equal to the values listed in the following table. * *table below*
7. The design factor for a rigging assembly used to support a worker must be at least 10 (OHS Regs, Sec. 350(2)).
8. Natural fibre rope must not be used for hoisting (OHS Regs, Sec. 351).
9. Where a wedge socket is used as a wire rope termination, the dead end of the rope must be secured to prevent release of the wedge or rope slippage at the socket (OHS Regs, Sec. 352).
10. Employer must ensure that a hook has a safety latch, mousing or shackle where the hook could cause injury if it's dislodged while in use; Exceptions: Employer may use another kind of hook if a competent worker disconnecting the hook would be in danger if the hook

has a safety latch, mousing, or shackle. Employer may also use a sorting hook for hoisting a skeleton steel structure or similar operations where a sorting hook is safer to use than a hook with a safety latch, mousing, or shackle (OHS Regs, Sec. 353).

11. During a hoisting operation in a caisson, an employer must not use a spring loaded safety latch hook, and must use a shackle assembly consisting of a pin fully shouldered into the eyes of the shackle and secured by a nut that’s prevented from rotating by a cotter pin (OHS Regs, Sec. 353(4)).
12. A shackle-pin, heel-pin, and similar device must be secured against dislodgement (OHS Regs, Sec. 354(1)).\
13. The pin in a screw-pin type shackle must be wired or otherwise secured against rotation when used in applications that may cause the pin to loosen (OHS Regs, Sec. 354(2)).
14. A shackle-pin must not be replaced with a bolt or other makeshift fitting (OHS Regs, Sec. 355).
15. A rope must be secured to its winding drum, unless the line is required to automatically disengage from the drum (OHS Regs, Sec. 356(1)).
16. A rope must not be fastened to a drum by a knot tied in the rope (OHS Regs, Sec. 356(2)).
17. At least 3 full wraps of rope must remain on winding drums where the load hook is in the lowest position (OHS Regs, Sec. 357).
18. A sheave must be:a. Correctly sized for the rope.b. Equipped with a device to retain the rope within the groove.c. Removed from service if it has a damaged groove or flange (OHS Regs, Sec. 358).
19. The strength of each guyline and its anchor must exceed the breaking strength of the load-line rigging arrangement (OHS Regs, Sec. 359(1)).
20. A guyline anchor must be placed so that the interior angle between the guyline and the horizontal plane doesn’t exceed 45 degrees (OHS Regs, Sec. 359(2)).

21. Guylines must be arranged so that the hoisting line pull in any direction is shared by 2 or more guys (OHS Regs, Sec. 359(3)).
22. Exception: Guylines and anchor systems, where certified by a professional engineer, may deviate from the requirements of Items #19 to #21 above (OHS Regs, Sec. 359(4)).
23. Workers not use their hands or feet or a hand-held object to guide the rope when spooling the rope onto a drum. Exception: In an emergency a worker may use a steel guide bar of acceptable design to guide the rope onto the drum but the line speed must be kept as low as practicable and the worker must be positioned to be clear of the drum (OHS Regs, Sec. 360).
24. Except as otherwise permitted by the manufacturer, the working load limit must be reduced in accordance with the efficiency rating for the type of termination specified in accordance with the table listed in Section 361 of the Regs (OHS Regs, Sec. 361).
25. Where a manufacturer’s specifications for installing and using wire rope clips can’t be determined, the number of clips and the installation torque must be in accordance with the table listed in Section 362 of the Regs (OHS Regs, Sec. 362).
26. A wire rope termination using a swaged fold back eye must be identified with a serial number or other unique identification code and proof-tested before being placed in service and a record of the proof test must be kept available for the service life of the termination (OHS Regs, Sec. 363(1)).
27. A swaged fold back eye termination shall be identified with the working load limit (OHS Regs, Sec. 363(2)).
28. Except where otherwise required by the Regulations, wire rope, alloy steel chain, metal mesh, synthetic fibre rope and synthetic fibre web slings must meet the requirements of ASME B30.9-1990, “Slings” (OHS Regs, Sec. 364).

29. Slings and attachments must be visually inspected before use and defective equipment must be immediately removed from service (OHS Regs, Sec. 365).
30. A sling must be stored to prevent damage when it’s not in use (OHS Regs, Sec. 366).\
31. A sling with a knot must not be used (OHS Regs, Sec. 367).
32. Where a sling is applied to a sharp edge of a load, the edge or the sling must be protected to prevent damage to the sling (OHS Regs, Sec. 368).
33. A sling must be selected and used to prevent slipping or overstressing the sling or the load (OHS Regs, Sec. 369(1)).
34. A load consisting of 2 or more pieces of material over 3 metres long must be slung using a 2-legged sling arrangement that’s positioned to keep the load horizontal during the lift and each sling must be choked around the load with a double wrap (OHS Regs, Sec. 369(2)).
35. For each multiple piece lift:a. Each member of the lift that’s being delivered to a different spot must be independently slung back to the main load hook or master link using graduated length slings.
    b. A lifted member must not support another lifted member (OHS Regs).

    c. A crane equipped with power-controlled lowering must be used (OHS Regs, Sec. 370).

36. A spreader bar or other specialized below-the-hook lifting devices must be constructed, inspected, installed, tested, maintained and operated in accordance with ASME B30.20-1993 “Below-the-Hook Lifting Devices” and its working load limit must be certified by a professional engineer or established by its manufacturer (OHS Regs, Sec. 371(1)).
37. A spreader bar or specialized below-the-hook lifting

device must display a nameplate or other permanent marking showing the:a. Manufacturer’s name and address. b. Serial number.

c. Weight of the device where it weighs more than 45 kilograms.

d. Working load limit (OHS Regs, Sec. 371(2)).

38. A spreader bar and other specialized below-the-hook lifting device must be considered part of the lifted load (OHS Regs, Sec. 372).

NOVA SCOTIA

1. All inspections required to be performed under this Section must be performed by a competent person (*Occ Safety General Regs*, Sec. 80(2)).
2. Employer must ensure that rigging hardware is constructed, installed, operated, inspected, and maintained in accordance with the latest version of the applicable ASME standard listed below:
    - ASME B30.9, “Slings”.
    - ASME B30.10, “Hooks”.
    - ASME B30.20, “Below-the-Hook Lifting Devices” (*Occ Safety General Regs*, Sec. 80(3)).
3. Where none of the standards referred to in Item #2 above apply, employer must ensure that the rigging hardware complies with an adequate design certified by an engineer (*Occ Safety General Regs*, Sec. 80(4)).
4. In addition to the requirements of Items #2 and #3 above, employer must ensure that rigging hardware that’s commercially manufactured is constructed, installed, operated, inspected, and maintained in accordance with the manufacturer’s specifications (*Occ Safety General Regs*, Sec. 80(5)).

5. In addition to any inspection required under Item #4 above, employer must ensure that a person inspects the rigging hardware before each use to ensure that no defect exists that may affect its structural integrity (*Occ Safety General Regs*, Sec. 80(6)).
6. In addition to the requirements of Items #4 and #5 above, employer must ensure that a person inspects the rigging hardware before it's put into initial service or after one month or more of disuse, and once during each year that it's in operation (*Occ Safety General Regs*, Sec. 80(7)).
7. Where the competent person conducting any of the inspections referred to above identifies a defect that may affect the structural integrity of the rigging hardware, employer must ensure that the rigging hardware is removed from service until it's repaired (*Occ Safety General Regs*, Sec. 80(8)).
8. Employer must maintain a record of:
    - The inspections referred to in Items #2, #4 and #6 above.
    - Any repairs to rigging hardware (*Occ Safety General Regs*, Sec. 80(9)).
9. The record referred to in Item #8 above must include the date, time, nature, and results of the inspection or repair and the name of the person who performed the inspection or repair (*Occ Safety General Regs*, Sec. 80(10)).
10. Employer must identify the safe lifting capacity of rigging hardware on the device in a permanent and clearly legible manner (*Occ Safety General Regs*, Sec. 80(11)).
11. Employer must ensure that a person using rigging hardware receives adequate training and other information sufficient to ensure that they're knowledgeable about the capacity of the rigging hardware

(*Occ Safety General Regs*, Sec. 80(12))

12. Employer must designate a competent person to use rigging hardware (*Occ Safety General Regs*, Sec. 80(13)).
13. Before a load is raised by a hoist, employer must ensure that a competent person ensures that the load is secured to the hoist in an adequate manner by means of appropriate rigging hardware (*Occ Safety General Regs*, Sec. 80(14)).

NORTHWEST TERRITORIES & NUNAVUT

ONTARIO

1. Blocking, support chains, metal bands, wire rope, and rigging components must be removed from material or equipment in a way that doesn't endanger a worker (OHS Const. Project Regs, Sec. 38).

2. A competent worker must inspect a crane's structural elements and rigging equipment for defects before each use of the crane (OHS Const. Project Regs, Sec. 153(9)).

3. A cable used by a crane or other hoisting device shall be wire rope or synthetic rope of the type, size, grade, and construction recommended by the manufacturer of the crane or other hoisting device (OHS Const. Project Regs, Sec. 168(1)).

4. All wire rope used on a crane or other hoisting device must:

a. Be compatible with the sheaves and the drum of the crane or other hoisting device.

b. Be lubricated to prevent corrosion and wear.

c. Not be spliced.

d. Have its end connections securely fastened.

e. Be kept with at least 3 full turns on the drum (OHS Const. Project Regs, Sec. 168(2)).

5. The following information must be included in the operator’s crane log in respect of any wire ropes installed on a tower crane:

a. The diameter of the rope.

b. The length of the rope.

c. The tensile strength of single wires and finish.

d. The wire rope construction, type of lay, and direction of lay.

e. The number of outer strands of the rope.

f. The type of core of the rope.

g. The nominal or minimum rated breaking strength of the rope.

h. The recommended maximum working load limit of the rope.

i. The type of end fitting or connection and proof-test results if applicable of the rope.

j. Whether the use of a swivel is permitted.

k. The name of the manufacturer or supplier of the rope.

l. The name of the person or organization issuing the wire rope written record and date it was issued (OHS Const. Project Regs, Sec. 168(3)).

6. No cable used by a crane or other hoisting device:

a. May contain 6 randomly-distributed wires that are broken in one rope lay or 3 or more wires that are broken in one strand in a rope lay.

b. May be smaller than its nominal rope diameter by more than:

i. One millimetre for a diameter up to and including 19 millimetres,

ii. 2 millimetres for a diameter greater than 19 millimetres up to and including 29 millimetres, and

iii. 3 millimetres for a diameter greater than 29 millimetres.

c. May be worn by more than one-third of the original diameter of its outside individual wires.

d. May show evidence of waviness, strand extrusion, wire extrusion, kinks, tightened loops, crushing, bird-caging, bends, or other damage resulting in distortion of the rope structure.

e. Shall have had any contact with electricity.

f. May show evidence of heat damage.

g. May show evidence of corrosion in excess of the rope manufacturer’s instructions (OHS Const. Project Regs, Sec. 168(4)).

7. If any damage to a cable is identified, the cable must be evaluated by a competent person to determine whether it meets the requirements of Item #6 above, and be taken out of service if the evaluation determines that the cable doesn’t meet such requirements (OHS Const. Project Regs, Sec. 168(5)).

8. No cable that’s static or used for pendants:

a. May contain 3 or more broken wires in one lay or in a section between end connectors; or

b. May have more than one broken wire at an end connector (OHS Const. Project Regs, Sec. 168(6)).

9. Rotation-resistant wire rope must not be used for a cable for boom hoist reeving unless specified by the crane manufacturer or as pendants (OHS Const. Project Regs, Sec.

168(7)).

10. Rotation-resistant wire rope must not be used where an inner wire or strand for a cable is damaged or broken (OHS Const. Project Regs, Sec. 168(8)).

11. Swivels must not be used on a boom hoist cable on a tower crane unless:

a. They're explicitly permitted by the tower crane manufacturer and wire rope manufacturer; or

b. An engineer evaluated the tower crane and wire rope and determined that a swivel may be used (OHS Const. Project Regs, Sec. 168.1).

12. A cable used by a crane or other hoisting device shall be capable of supporting at least:

a. Three and one-half times the maximum load to which it's likely to be subjected if it's used on a device other than a tower crane and it winds on a drum or passes over a sheave.

b. Five times the maximum load to which it's likely to be subjected if it's used on a tower crane and it winds on a drum or passes over a sheave.

c. Three times the maximum load to which it's likely to be subjected if it's a pendant or isn't subject to winding or bending.

d. Ten times the maximum load to which it's likely to be subjected if the crane or other hoisting device is used for supporting persons (OHS Const. Project Regs, Sec. 169).

13. All cables used by a crane or other hoisting device must be visually inspected by a competent worker at least once a week when the crane or other hoisting device is being used, or more frequently, if recommended by the cable manufacturer (OHS Const. Project Regs, Sec. 170(1)).

14. The worker performing an inspection must record the condition of the cable inspected and a record of the inspection must be kept at the project while the crane or other hoisting device is in use at the project (OHS Const. Project Regs, Sec. 170(2)).

15. If an inspection under Item #13 is of a cable used by a crane or similar hoisting device, the record of inspection must be made in the operator's crane log (OHS Const. Project Regs, Sec. 170(3)).

16. A cable used by a crane or other hoisting device must be adequately attached:

a. By binding and fastening the cable around an oval thimble in a way that's strong enough to prevent the cable thimble from separating.

b. By fastening the cable within a tapered socket by means of virgin zinc or epoxy resin.

c. By fastening the cable with a wedge-type socket fitted with a wire rope clip at the dead end to prevent the accidental release or loosening of the wedge (OHS Const. Project Regs, Sec. 171(1)).

17. The dead end cable of a wedge socket assembly on a hoisting line must extend between 100 millimetres and 300 millimetres out of the socket (OHS Const. Project Regs, Sec. 171(2)).

18. All wire rope terminations used on a tower crane must be proof tested after installation onto the wire rope in accordance with the recommendations of the wire rope or termination manufacturer, but in no case to more than 50% of the wire rope's nominal or minimum rated breaking strength, and permanent records of the proof testing must be kept for the life of the terminations (OHS Const. Project Regs, Sec. 171(3)).

19. A container, sling, or similar device for rigging or hoisting an object, including its fittings and attachments, must be:

a. Suitable for its intended use.

b. Suitable for and capable of supporting the object being rigged or hoisted.

c. So arranged as to prevent the object or any part of the object from slipping or falling.

d. Capable of supporting at least 5 times the maximum load to which it may be subjected.

e. Capable of supporting at least 10 times the load to which it may be subjected if it’s to be used to support a person (OHS Const. Project Regs, Sec. 172(1)).

20. A sling or similar device made of web-type fabric or nylon must be labelled to indicate its load rating capacity (OHS Const. Project Regs, Sec. 172(2)).

21. No sling or similar device for rigging or hoisting made of web-type fabric or nylon may be used if it may be cut (OHS Const. Project Regs, Sec. 172(4)).

22. Every hoisting hook must be equipped with a safety catch. Exception: No safety catch is required on a hoisting hook used in placing structural members if the method of placing protects workers to the same standard as a safety catch does (OHS Const. Project Regs, Secs. 173(1) + (2)).

23. A hoisting hook must have its load rating legibly cast or stamped on it in a location where the person using the hook can readily see it (OHS Const. Project Regs, Sec. 173(3)).

24. A hoisting hook must not be used if it’s cracked, has a throat opening greater than as manufactured, or is twisted from the plane of the unbent hook (OHS Const. Project Regs,

Sec. 173(4)).

25. A hook block must have its load rating and weight legibly cast or stamped on it in a conspicuous location (OHS Const. Project Regs, Sec. 174).

26. An overhauling weight used on the cable of a crane or other hoisting device, must be:

a. Prevented from sliding up or down the cable; and

b. Securely attached to the load hook and the cable (OHS Const. Project Regs, Sec. 175(1)).

27. No overhauling weight used on the cable of a crane or other hoisting device may be split (OHS Const. Project Regs, Sec. 175(2)).

28. Only an alloy steel chain or a chain manufactured for the purpose may be used for hoisting (OHS Const. Project Regs, Sec. 176(1)).

29. No alloy steel chain shall be annealed or welded (OHS Const. Project Regs, Sec. 176(2)).

30. A chain used for hoisting must:

a. Be labelled to indicate its load rating capacity.

b. Be repaired and reconditioned in accordance with the specifications of its manufacturer.

c. After being repaired or reconditioned, be proof tested in accordance with the specifications of its manufacturer.

d. Be visually inspected by a competent worker as frequently as recommended by its manufacturer and, in any case, at least once a week when the chain is in service (OHS Const. Project Regs, Sec. 176(3)).

31. A friction-type clamp used in hoisting materials must be

constructed so that an accidental slackening of the hoisting cable doesn’t release the clamp (OHS Const. Project Regs, Sec. 178).

PRINCE EDWARD ISLAND

1. Employer must ensure that chains, slings and wire ropes meet the following specifications:

a. Hoisting and sling chains must be made of wrought iron or steel.

b. The rings, hooks, shackles and end links for hoisting and sling chains must be made of wrought iron or steel.

c. The factor of safety for new hoisting or sling chains must be at least 5.

d. Hoisting or sling chains must be withdrawn from service if:

i. The chains have become unsafe through overloading, or through faulty or improper annealing.

ii. The chains have stretched more than 5% of their original length.

iii. The interlink wear exceeds one-fourth the thickness of the original link.

e. All hoisting or sling chains must have the safe working load marked on the bull rings or hooks or on special links near the ends of the chain.

f. Chains must be free of kinks, knots and twists when used for hoisting loads.

g. Splicing of hoisting or sling chains by wiring links together, by inserting bolts between links, or by passing one link through another and inserting a bolt or nail to hold it, is prohibited.

h. Hoisting chains must be wound only on drums, shafts or sheaves that are provided with grooves of such size and shape as to allow the chains to work smoothly without twisting (OHS Act, Gen Regs, Sec. 46.1).

2. Wire rope for hoisting, lowering or hauling loads must be of proper construction and size for the operation (OHS Act, Gen Regs, Sec. 46.2).

3. The factor of safety for wire rope must be at least 6 (OHS Act, Gen Regs, Sec. 46.3).

4. Eye splices, sockets, and rope anchorages subjected to a direct tensile load must be capable of withstanding a load of at least 6 times the maximum permissible working load (OHS Act, Gen Regs, Sec. 46.4).

5. Eye splices and loops for the attachment of hooks, rings, and other parts to wire ropes must be provided with suitable thimbles (OHS Act, Gen Regs, Sec. 46.5).

6. Wire rope must be removed from service whenever its strength is affected by broken wires to the following extent:

a. 6 by 7 wire rope: 12% on a length of 508 mm (20 in).

b. 6 by 19 wire rope: 20% on a length of 508 mm (20 in).

c. 6 by 37 wire rope: 25% on a length of 508 mm (20 in).

d. 6 by 61 wire rope: 25% on a length of 508 mm (20 in) (OHS Act, Gen Regs, Sec. 46.6).

7. The size, material, and the maximum safe working load must be marked on all wire ropes by means of metal tags or in another suitable way (OHS Act, Gen Regs, Sec. 46.7).

8. Wire ropes used for hoisting, lowering, or hauling loads must be free from kinks and knots (OHS Act, Gen Regs, Sec. 46.8).

9. Ends of wire rope must be seized to prevent the strands from becoming loose (OHS Act, Gen Regs, Sec. 46.9).

10. Fastenings of wire ropes must be carefully examined at regular intervals, and clips or clamps must be tightened if they show signs of loosening (OHS Act, Gen Regs, Sec. 46.10).

11. When there is the least sign of a dangerous condition at sockets or other fastenings of wire ropes, a section of the rope from 914 mm to 3 048 mm (3 ft. to 10 ft.) above the fastening must be cut off and the rope refastened (OHS Act, Gen Regs, Sec. 46.11).

12. A thimble or loop splice made in any wire rope must have at least 3 tucks with a whole strand of rope and 2 tucks with one half the wires cut out of each strand (OHS Act, Gen Regs, Sec. 46.12).

13. Wire ropes must be treated at regular intervals with suitable lubricants (OHS Act, Gen Regs, Sec. 46.13).

14. Fibre rope for hoisting, lowering or hauling loads must be of high-grade hemp or other rope of equal quality, capable of withstanding a load of at least 5 171.04 kg per cm^2 (11,400 lbs. per sq.in.) (OHS Act, Gen Regs, Sec. 46.14).

15. Fibre rope must have a factor of safety of 10 (OHS Act, Gen Regs, Sec. 46.15).

16. All fibre ropes used for hoisting must bear a metal tag on which is stamped a number referring to an inventory giving the:

a. Name of supplier.

b. Date of placement into service.

c. Maximum permissible load (OHS Act, Gen Regs, Sec. 46.16).

17. Fibre rope must be seized on the ends to prevent fraying

(OHS Act, Gen Regs, Sec. 46.17).

18. Eye splices on fibre rope must be made around suitable thimbles (OHS Act, Gen Regs, Sec. 46.18).

QUÉBEC

General Requirements

1. Hoisting accessories must be solidly built, have requisite resistance, depending on their use, and be kept in good working order (OHS Regs, Sec. 246).

2. Before hoisting a load, the operator or the signalman must ensure that all the cables, chains, slings, or other moorings are properly attached to the load and that hoisting doesn’t present any hazard (OHS Regs, Sec. 255(1)).

3. No person may stand on a load, a hook, or a sling suspended from a hoisting device (OHS Regs, Sec. 255(7)).

4. The hooks used to hoist loads as well as those attached to slings must be equipped with a safety catch except where these hooks are specifically designed for the safe hoisting of certain loads (OHS Regs, Sec. 255(8)).

Requirements for Construction

5. Any hoisting cable for scaffoldings must:

a. Be designed for this use and of the appropriate diameter of no less than: 19 mm for fibre cables, or 8 mm for metallic cables.

b. Have a safety factor of 10.

c. Be provided with the appropriate sockets when spliced into eyeholes or links—if cable terminal clamps are used, they must be of a size appropriate to the diameter of the metallic cable, and so placed that the band of the U is on the

supporting end of the cable.

d. Be bound at both ends to avoid unravelling of the strands.

e. Be shielded from projections of the building.

f. Be adequately protected when corrosive substances are used nearby.

g. Be kept in a cool and dry place protected against chemical or corrosive vapours.

h. Where used with a hoisting apparatus having a friction drum, be long enough to reach the ground or be prevented from coming out of the hoisting apparatus by twisting the free end around an eyelet and fixing it by means of a cable clamp.

i. If used with a hoisting apparatus having a winding drum, be fixed to the drum with a fastener having a minimum resistance of 80% of the breaking point of the hoisting cable (Safety Code for Const. Industry, Sec. 3.9.13.(1)).

6. A fibre cable may not be used:

a. When the suspension points are more than 30 m above ground.

b. On winch drums.

c. Near corrosive or chemical substances unless it’s been appropriately treated (Safety Code for Const. Industry, Sec. 3.9.13.(2)).

7. A fibre cable must not drag on rough surfaces and must be kept in good condition by drying it out and protecting it from frost (Safety Code for Const. Industry, Sec. 3.9.13.(2)).

8. A fibre cable must be replaced after 2 years of services or before, if the cable is frayed and if the strands are discoloured or blackened and are beginning to crumble by producing a whitish dust (Safety Code for Const. Industry, Sec. 3.9.13.(2)).

9. Synthetic fibre cable may be used in place of fibre cable if the same standards are fulfilled and if it has an equivalent strength (Safety Code for Const. Industry, Sec. 3.9.13.(3)).

10. Any metallic cable must:

a. Comply with the rules of the Hoisting and Rigging Safety Manual of the Construction Safety Association of Ontario, translated by the CNESST and published by Les Publications du Québec.

b. Be made of a minimum of 6 strands of 19 wires.

c. Have a hemp core or an equivalent flexible core if the cable is wound around the hoisting drum in a single layer, or a steel core in other cases.

d. Be maintained in good condition by:

i. Following all the manufacturer’s instructions.

ii. Handling it in such a manner as to avoid any kink.

iii. Frequently applying an appropriate lubricant to help keep it flexible and protect it from rust.

iv. Using it only on pulleys or drums which are smooth and without any ragged edges (Safety Code for Const. Industry, Sec. 3.9.13.(4)).

11. Unless a test shows that nowhere along the cable has the breaking point been lowered to less than 90% of the original point, the hoisting cable must be replaced if:

a. 4% of the total number of wires in the cable are broken in one strand through the cable pitch, approximately 6 1/2 times the diameter of the cable, when used on a winding drum, or 2% on a friction drum.

b. The original diameter, measured on an unstretched cable,

has been reduced by:

i. 0.8 mm for cables of 8 mm to 15 mm in diameter; or

ii. 1.2 mm for cables of 15 mm to 25 mm in diameter.

c. The exterior wires present a worn aspect covering more than 50% of their diameter.

d. Corrosion is more than superficial (Safety Code for Const. Industry, Sec. 3.9.13.(5)).

12. Any hoisting cable used on an apparatus may not be left lying on the ground, but must be kept in a receptacle (Safety Code for Const. Industry, Sec. 3.9.13.(6)).

SASKATCHEWAN

1. Employer or contractor must ensure that every hoist, crane, and lifting device, including all rigging, used at a place of employment is designed, constructed, installed, maintained, and operated to perform safely any task for which it's used (OHS Regs, Sec. 13-3(1)).
2. Supplier must ensure that every hoist, crane and lifting device, including all rigging, supplied for use at a place of employment is designed, constructed, installed, maintained, and operated to perform safely any task for which it's intended to be used (OHS Regs, Sec. 13-3(2)).
3. Where a potentially hazardous defect is found in a hoist, crane, lifting device, or rigging, an employer, contractor, or supplier must:
a. Take steps immediately to protect the health and safety of any worker who may be at risk until the defect is repaired or the unsafe condition is corrected.
b. As soon as is reasonably practicable, repair any defect or correct any unsafe condition (OHS Regs, Sec. 13-18(2)).
4. Employer or contractor must ensure that:
a. All rigging is assembled, used, maintained and dismantled

under the supervision of a competent worker and in accordance with the manufacturer’s specifications and instructions.
b. Any worker who’s required or permitted to assemble, use, maintain, or dismantle rigging is trained in safe rigging practices (OHS Regs, Sec. 14-2).
5. Employer or contractor must ensure that all rigging and components of rigging are inspected thoroughly at appropriate intervals and visually inspected before use to ensure that the rigging and rigging components will safely perform their intended function (OHS Regs, Sec. 14-3).
6. Employer or contractor must ensure that no load is imposed on any rigging in excess of:
a. 10% of the breaking strength of the weakest part of the rigging, in the case of rigging used to raise or lower workers; and
b. 20% of the breaking strength of the weakest part of the rigging, in the case of any other rigging (OHS Regs, Sec. 14-4(1)).
7. Employer, contractor, or supplier must ensure that the maximum load that may be hoisted by any rigging, as determined by the manufacturer of the rigging or a professional engineer, is conspicuously marked on the rigging (OHS Regs, Sec. 14-4(2)).
8. If it’s not practicable to conspicuously mark the maximum load on the rigging, the employer or contractor must ensure that information about the maximum load that may be hoisted by the rigging is made readily available to the workers (OHS Regs, Sec. 14-4(3)).
9. Employer or contractor must ensure that a sling used to hoist a load and the sling’s fittings and attachments are:
a. Suitable for their intended use.
b. Suitable for, and capable of, supporting the load being hoisted.
c. Arranged to prevent the load or any part of the load from slipping or falling.
d. Arranged to ensure that the load is equally divided among the slings, when more than 1 sling is used.

e. Capable of supporting:
i. At least 10 times the load to which the slings, fittings, and attachments may be subjected, if they're used to support a worker.
ii. At least 5 times the maximum load to which the sling, fittings and attachments may be subjected, in any other case.
f. Guarded to prevent damage to the sling, if the sling may be applied over a sharp edge (OHS Regs, Sec. 14-5(1)).
10. Employer, contractor, or supplier must ensure that a sling:
a. Is clearly labelled to indicate its maximum load or the maximum load is made readily available to workers; and
b. Is not used if the sling has been or may be damaged (OHS Regs, Sec. 14-5(2)).
11. Employer or contractor must ensure that no shackle is subjected to a load greater than the maximum load indicated on the shackle (OHS Regs, Sec. 14-6(1))
12. Employer or contractor must ensure that:
a. All shackle pins are installed to prevent accidental withdrawal; and
b. A bolt is never used in place of a properly fitted shackle pin (OHS Regs, Sec. 14-6(2)).
13. Employer or contractor must ensure that:
a. The diameter of a sheave, spool or drum for wire rope is not less than the diameter specified by the manufacturer of the rope, and the rope is the correct size for the sheave, spool, or drum over which the rope passes.
b. The grooving of a sheave is the correct size for the diameter of rope.
c. A block or sheave is constructed or installed so that the rope can't leave the block or sheave groove (OHS Regs, Sec. 14-7(1)).
14. Employer or contractor must ensure that:
a. Rope fastened to a winding drum is fastened securely.
b. The number of full wraps of rope that remain on a winding drum corresponds to the manufacturer's specifications.
c. If there are no manufacturer's specifications, no less than

5 full wraps of rope remain on a winding drum at all times (OHS Regs, Sec. 14-7(2)).
15. Employer or contractor must ensure that:
a. No knot or wire rope clip is used as a stopper on a rope or rope end that passes through a winding drum; and
b. No knot is used to connect rigging hardware to a wire rope (OHS Regs, Sec. 14-8(1)).
16. Employer or contractor must ensure that all wire rope clips are:
a. Made of drop-forged steel.
b. Installed according to the manufacturer's instructions.
c. Inspected at frequent intervals to ensure the nuts are tight (OHS Regs, Sec. 14-8(2)).
17. If U-bolt clips are used to fasten wire rope, employer or contractor must ensure that:
a. The U-bolt is installed so that the U section bears on the short or dead end of the rope and the saddle bears on the long or live end of the rope.
b. The nuts are correctly torqued.
c. The number of clips and amount of rope turn-back conform to the manufacturer's specifications and instructions (OHS Regs, Sec. 14-8(3)).
18. If double saddle or fist clips are used to fasten wire rope, employer, or contractor must ensure that the clips are installed in numbers and with the amount of rope turn-back specified by the manufacturer (OHS Regs, Sec. 14-8(4)).
19. If double base clips are used to fasten wire rope, employer, or contractor must ensure that the clips are no less than 6 rope diameters in length (OHS Regs, Sec. 14-18(5)).
20. Employer or contractor must ensure that every eye loop used in a sling:
a. Is formed from either a Flemish eye splice secured by a pressed steel ferrule or a steel wire loop secured by a cold-formed aluminum alloy ferrule; and
b. Is readily identifiable as being formed in accordance with above subparagraph (a) (OHS Regs, Sec. 14-9(1)).
21. Unless the manufacturer of a rope specifies otherwise,

employer, or contractor must ensure that a suitable and properly sized thimble is inserted in an eye loop to increase the strength of the eye and decrease wear on the rope (OHS Regs, Sec. 14-9(2)).

22. If the dislodgment of a hook could injure a worker, employer, or contractor must ensure that the hook is secured by a safety latch, mousing, shackle, or other effective means, unless:

a. Skeleton steel is being hoisted or a similar operation is being performed while a sorting or grab hook is being used.

b. Power poles or telephone poles are being hoisted into place or removed using an approved S-hook.

c. The design of the hook and the work practices used prevent dislodgement of the hook.

d. The health and safety of a worker disconnecting the hook would be placed at risk (OHS Regs, Sec. 14-10(1)).

23. Employer or contractor must not require or permit a worker to use a hook if:

a. The throat opening of the hook has been increased or the tip has been bent more than 10° out of plane from the hook body; or

b. Any dimension of the hook has been reduced by more than 10% (OHS Regs, Sec. 14-10(2)).

24. Employer or contractor must not require or permit a worker to side load, back load, or tip load a hook unless the hook has been specifically designed for that purpose (OHS Regs, Sec. 14-10(3)).

25. Employer, contractor, or supplier must ensure that:

a. A hook is clearly labelled with the maximum load of the hook in a location where a worker using the hook can easily see the rating; or

b. The hook’s maximum load is made readily available to workers (OHS Regs, Sec. 14-10(4)).

26. Employer or contractor must not require or permit a worker to allow a load to bear against a safety latch, mousing, or shackle (OHS Regs, Sec. 14-10(5)).

27. If a wedge socket is used to anchor a wire rope, employer

or contractor must ensure that:
a. The wedge socket is installed according to an approved method.
b. The dead end of the wire rope extends at least 15 cm beyond the wedge socket.
c. The wire rope is fitted with a wire rope clip to prevent accidental release or loosening of the wedge (OHS Regs, Sec. 14-11).
28. Employer or contractor must ensure that wire rope used in rigging:
a. Is the type, size, grade, and construction recommended by the manufacturer of the hoisting equipment or is rope of an equivalent type, size, grade, and construction.
b. Is compatible with the sheaves and the drum of the hoisting equipment.
c. Is lubricated to prevent corrosion and wear.
d. Is not spliced or knotted.
e. Is fitted with end connections that:
i. Conform to the manufacturer's specifications concerning number, size and installation method, and
ii. Are securely fastened to the wire rope (OHS Regs, Sec. 14-12(1)).
29. Employer or contractor must ensure that no wire rope used in rigging:
a. Contains 6 or more randomly-distributed wires that are broken in one rope lay, or 3 or more wires that are broken in one strand in a rope lay.
b. Is worn by more than one-third of the original diameter of the wire rope's outside individual wires.
c. Shows evidence of kinking, birdcaging, corrosion, or other damage resulting in distortion of the rope structure, or damage that could result in rope failure (OHS Regs, Sec. 14-12(2)).
30. Employer or contractor must ensure that no wire rope that's static or that's used for pendants has:
a. 3 or more broken wires in one lay or in a section between end connectors; or

b. One or more broken wires at an end connector (OHS Regs, Sec. 14-12(3)).
31. Employer or contractor must ensure that rotation-resistant wire rope is not used:
a. As a cable in boom hoist reeving and pendants; or
b. If an inner wire or strand of the wire rope is damaged or broken (OHS Regs, Sec. 14-12(4)).
32. Employer or contractor must ensure that no load is imposed on any wire rope that exceeds the maximum load recommended by the manufacturer of the wire rope (OHS Regs, Sec. 14-12(5)).

YUKON

1. Rigging and slinging work must be done by or under the direct supervision of a qualified person familiar with the rigging to be used and the code of signals for hoisting operations (WSC Regs, Sec. 5.22(1)).

2. Loads to be unhooked by a worker must be safely landed and supported before the rigging is detached (WSC Regs, Sec. 5.22(2)).

3. Rigging and fittings may be used only for the purposes for which they were designed and manufactured (WSC Regs, Sec. 5.22(3)).

4. The load applied to any rigging or rigging assembly must not exceed the working load limit (WSC Regs, Sec. 5.22(4)).

5. A worker must be positioned in the clear to prevent exposure to moving logs, saplings, root wads, chunks, rigging, or other material before any load is moved (WSC Regs, Sec. 5.22(6)).

6. A worker must keep clear of rigging that’s stopped by an obstruction until the rigging has been slackened to reduce the hazard (WSC Regs, Sec. 5.22(7)).

7. Rigging fittings must be marked with the manufacturer’s

identification, product identifier, and working load limit or sufficient information to readily determine the working load limit (WSC Regs, Sec. 5.23(1)).

8. The working load limit of existing fittings that don’t meet the requirements of Item #7 must be determined by a qualified person and marked on the fitting, and such fittings must have been removed from service within one year of the effective date of the WSC Regulations (WSC Regs, Sec. 5.23(2)).

9. The design factors based on breaking strengths for rigging components shall be at least equal to the values listed in **Table 5-1* of the Regs, except as otherwise specified in the Regs (WSC Regs, Sec. 5.23(3)).

10. If the above design factors specified are reduced for a dedicated rigging assembly, they must be designed and certified by a professional engineer for a specific lift, and the dedicated assembly must be re-rated for any continued use (*WSC Regs*, Sec. 5.23(4)).

11. The design factor for any rigging assembly used to support workers shall be at least 10 (*WSC Regs*, Sec. 5.23(5)).

12. No worker may ride on a load, sling, hook or any other rigging equipment, unless it’s a basket certified for that purpose (*WSC Regs*, Sec. 5.34).

Table 15-1: Minimum Design Factors for Rigging

Item	Component	Minimum design factor
1	Nylon fibre rope sling	5
2	Polyester rope sling	5
3	Polypropylene rope sling	5
4	Alloy steel chain sling	4

Item	Component	Minimum design factor
5	Wire rope sling	5
6	Metal mesh sling	5
7	Synthetic web sling	5
8	Synthetic roundsling	5
9	Chain fittings	4
10	Wire rope sling fittings	5
11	Other fittings	as specified by manufacturer
12	Non-rotating wire rope	as specified by manufacturer but not less than 5
13	Conventional wire rope	5

Table 15-3: WLL reductions for slings at an angle

Angle between the sling leg and vertical	Reduce WLL to
up to 30°	90%
over 30° up to 45°	70%
over 45° up to 60°	50%
over 60°	Not permitted unless part of an engineered lift.

Newfoundland & Labrador

Component	Design Factor
Nylon fibre rope sling	9
Polyester rope sling	9
Polypropylene rope sling	9
Alloy steel chain sling	4
Wire rope sling	5

Component	Design Factor
Metal mesh sling	5
Synthetic web sling	5
Chain fittings	5
Wire rope sling fittings	5
Other fittings	As specified by manufacturer
Nonrotating wire rope	As specified by manufacturer but not less than 5
Conventional wire rope	5 (OHS Regs, Sec. 350(1))

Yukon: **Table 5-1 Design Factors for Rigging**

Component	Design Factor
Nylon fibre rope sling	9
Polyester rope sling	9
Polypropylene rope sling	9
Alloy steel chain sling	4
Wire rope sling	5
Metal mesh sling	5
Synthetic web sling	5
Chain fittings	5
Wire rope sling fittings	5
Non-rotating wire ropes	as specified by manufacturer, but not less than 5
Conventional wire rope	5
Other	fittings as specified by manufacturer