

## PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION

### CONCRETE PUMPING

<b>Definition</b>	<b>20.26.1</b>	<b>In sections 20.26.2 to 20.54, “mast” means a mounting or support structure, other than a truck or trailer, for a concrete placing boom.</b>
<b>Application of regulation</b>	<b>20.26.2</b>	<b>Sections 20.31, 20.32, 20.37, 20.38, 20.40 (3), 20.43 (4) and 20.45 do not apply in relation to concrete pumps or placing booms manufactured on or after August 1, 2012.</b>
<b>Standards</b>	<b>20.26.3</b>	<b>(1) The operation, inspection, testing and maintenance of a concrete pump or placing boom manufactured before August 1, 2012 must meet the requirements of <i>CSA Standard Z151-09, Concrete pumps and placing booms</i>, as set out in clauses 1.1 to 3 [definitions], 4.1.9.2.3, 4.1.18.2, 4.1.19.1, 4.2.1.1, 4.2.2, 5.1.1 to 5.3.4, 5.3.7 to 6.3.4 and 6.5.1 to 6.7.3, including any table, figure or annex referred to in those clauses.</b> <b>(2) The design, manufacture, installation, operation, inspection, testing and maintenance of a concrete pump or placing boom manufactured on or after August 1, 2012 must meet the requirements of <i>CSA Standard Z151-09, Concrete pumps and placing booms</i>, as set out in clauses 1.1 to 3 [Definitions], 4.1.1.2 to 5.3.4, 5.3.7 to 6.3.4 and 6.5.1 to 6.7.3, including any table, figure or annex referred to in those clauses.</b>
<b>Equipment identification</b>	<b>20.27</b>	<b>(1) A <del>concrete pump, placing boom and mast</del> must bear a legible identification plate specifying</b> <b>(a) the manufacturer's name,</b> <b>(b) the year of manufacture,</b> <b>(c) the model and serial number, and</b> <b>(d) <del>the maximum pressure the concrete pump can generate.</del></b> <b>(e) the allowable load.</b> <b>(2) A <del>concrete placing boom or mast</del> not affixed to a <del>concrete pump</del> must bear an identification plate specifying</b> <b>(a) <del>the manufacturer's name,</del></b> <b>(b) <del>the model and serial number,</del></b> <b>(c) <del>the maximum allowable concrete pressure in the delivery pipe, and</del></b> <b>(d) <del>the maximum allowable pipe diameter and permitted wall thickness.</del></b>
<b>Manufacturer's, supplier's or integrator's manual</b>	<b>20.28</b>	<b>(1) The manufacturer's, supplier's or integrator's manual for a concrete pump or placing boom, comprised of the documentation listed in clause 4.1.18.1 of <i>CSA Standard Z151-09, Concrete pumps and placing booms</i>, must be readily accessible to the operator and to maintenance personnel.</b> <b>(2) The manufacturer's <del>operation and maintenance manual for a concrete pump, placing boom and mast</del> must be readily accessible to the operator and to maintenance personnel.</b> <b>(a) operation and maintenance manual for a mast must be readily accessible to the operator and to maintenance personnel, and</b> <b>(b) instructions for erection and use of a mast must be readily accessible to the installer, the operator and to maintenance personnel.</b>

**AMENDMENTS TO PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

<b>Inspection and maintenance records</b>	<b>20.29</b>	Records of inspection and maintenance as required by Part 4 (General Conditions) <b>of this regulation</b> must be made by the equipment operator and other persons inspecting and maintaining a concrete <b>pump</b> , placing boom or mast.
<b>Pre-use inspection</b>	<b>20.30</b>	<p>(1) The operator must inspect a concrete <b>pump</b>, placing boom <del>or</del> <b>and</b> mast and test its safety and control devices before use on each shift and record the results of the inspection and tests in accordance with section 20.29.</p> <p>(2) Any defects found in the concrete <b>pump</b>, placing boom or mast must be recorded according to section 20.29 and reported immediately to the supervisor or employer, who must determine the course of action.</p> <p>(3) If a defect may affect the safe operation of the concrete <b>pump</b>, placing boom or mast, the equipment must not be used until the defect has been remedied.</p>
<b>Design and construction</b>	<b>20.30.1</b>	<b>A concrete placing boom, mast and other structural supports must be designed and constructed so that, when this equipment is operated in accordance with the manufacturer's intended use, stresses to the load bearing components do not exceed the components' structural limits and the equipment is capable of carrying out its design function with an adequate margin of safety.</b>
<b>Controls</b>	<b>20.31</b>	Controls for a concrete <b>pump</b> , placing boom or mast must have their function clearly identified, <b>and be located and maintained to allow safe operation of the concrete pump, placing boom and mast.</b>
<b>Hydraulic cylinders</b>	<b>20.32</b>	<p>(1) Hydraulic cylinders on a concrete pump, placing boom and mast must have pressure relief valves to prevent cylinder and boom damage due to excess pressure.</p> <p>(2) Hydraulic holding valves must be used on a <b>concrete pump</b>, placing boom or mast if hydraulic hose or coupling failure could result in uncontrolled movement of mechanisms.</p>
<b>Marking weight</b>	<b>20.33</b>	A trailer or skid mounted concrete pump must have a permanent, legible notice stating the total weight of the unit.
<b>Lifting a pump</b>	<b>20.34</b>	A concrete pump may only be lifted using the lift points specified by the manufacturer or a professional engineer.
<b>Securing a pump</b>	<b>20.35</b>	The trailer or skid on which a concrete pump is mounted must be secured to prevent movement during pumping.
<b>Emergency shutoff</b>	<b>20.36</b>	<del>A concrete pump must have a clearly labelled emergency stop switch near the hopper which if activated will stop the pumping action.</del>
<b>Agitator guarding</b>	<b>20.37</b>	<p>(1) Concrete pump agitator guarding must be maintained to the pump manufacturer's specifications, with reasonable allowance for wear.</p> <p>(2) Bent bars in a concrete pump agitator grill guard must be repaired.</p> <p>(3) Concrete pump grill bar spacing may be increased to a maximum bar spacing of 8 cm (3¼ in) when pumping concrete mixes with a slump of 5 cm (2 in) or less and provided specific instructions are given to the crew regarding the hazard present due to the larger openings in the grill guard.</p> <p>(4) The distance from the grill bars to the concrete pump's agitator must be at least 7.5 cm (3 in).</p>

**AMENDMENTS TO PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

		(5) A concrete pump agitator grill guard must be hinged or bolted in place.
		(6) A person must not stand on the grill when the concrete pump or agitator is running.
<b>Engine exhaust</b>	<b>20.38</b>	A concrete pump's engine exhaust system must be arranged to prevent exhaust exposure to the operator and hopper area.
<b>Housekeeping</b>	<b>20.39</b>	The deck area of a concrete pump must be kept clean and free of unnecessary objects.
<b>Outriggers</b>	<b>20.40</b>	(1) Outriggers must be used in accordance with the concrete placing boom <del>or mast</del> manufacturer's specifications. (2) Extendible outriggers for a concrete placing boom <del>or mast</del> must be marked to indicate maximum extension. (3) A concrete placing boom <del>or mast</del> manufactured after January 1, 1999 must have its outriggers or jacks permanently marked to indicate the maximum load they will transmit to the ground.
<b>Use of placing boom</b>	<b>20.41</b>	(1) Repealed. [B.C. Reg. 312/2003.] (2) Repealed. [B.C. Reg. 312/2003.] (3) <del>A concrete placing boom or mast must not be used to drag hoses or other loads.</del>
<b>Pipe diameter and thickness</b>	<b>20.42</b>	(1) Repealed. [B.C. Reg. 312/2003.] (2) The wall thickness of pipe mounted on a concrete placing boom <del>or mast</del> must be sufficient to withstand a pressure greater than the maximum pressure that the concrete pump can produce in the concrete being pumped. (3) Pipe sections must be replaced when thickness measurements indicate that wall thickness has been reduced to the limits specified by the manufacturer.
<b>Pipe clamps</b>	<b>20.43</b>	(1) Concrete must not be pumped through pipe with grooved ends, such as those for Victaulic-type couplers. (2) Pipe clamps used with pipe carrying concrete must have a pressure rating at least equal to the pipe pressure rating. (3) To ensure proper connection of concrete delivery pipes, pipe and pipe clamp contact surfaces must be free of concrete and other foreign matter when a connection is being made. (4) Quick connect clamps used on a concrete delivery pipe must be pinned or secured after installation to keep them from inadvertently opening.
<b>Delivery pipe</b>	<b>20.44</b>	Delivery pipe between the concrete pump and the placing system must be supported and anchored to prevent movement and excessive loading on pipe clamps.
<b>Restraining devices</b>	<b>20.45</b>	Restraining devices providing a safety factor of at least 5 must be used on attachments suspended from the placing boom or mast tip.
<b>Concrete pump lines</b>	<b>20.46</b>	(1) Concrete pump discharge line couplings, if located where inadvertent disconnection could cause injury to workers, must be guarded. (2) The guards on a discharge line coupling must be positioned to effectively deflect in a safe direction any jet of concrete which might result from disconnection of the coupling.

**AMENDMENTS TO PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

<b>Equipment inspection</b>	<b>20.47</b>	<p><b>(1)</b> <del>A concrete placing boom and mast must be inspected in accordance with good engineering practice at intervals not exceeding 12 months, repaired as necessary, and certified safe for use by a professional engineer, the manufacturer or the manufacturer's authorized agent.</del></p> <p><b>(2) Despite section 20.26 of this regulation,</b></p> <p><b>(a)</b> a reference to a "qualified person" in clauses 5.2.2.2.1 to 5.2.2.2.3 of <i>CSA Standard Z151-09, Concrete pumps and placing booms</i>, must be read as a reference to a person who is a professional engineer, and</p> <p><b>(b)</b> a reference to a "person qualified to the requirements of CSA W178.2" or to a "representative authorized by the manufacturer" in clause 5.2.2.2.2 of <i>CSA Standard Z151-09, Concrete pumps and placing booms</i>, must be read as a reference to a person who is a professional engineer.</p>
<b>Repair certification and modification</b>	<b>20.48</b>	<p><b>(1)</b> Replacement parts used for repair of a concrete pump, placing boom or mast must meet or exceed the original manufacturer's specifications or be certified by a professional engineer.</p> <p><b>(2) If a repair is made to a load bearing component of a concrete pump, placing boom or mast,</b></p> <p><b>(a)</b> the repaired component must meet or exceed the original manufacturer's specifications, or</p> <p><b>(b)</b> the repair must be certified by a professional engineer, before the concrete pump, placing boom or mast may be operated.</p> <p><b>(3) If a modification affecting the safe operation of a concrete pump, placing boom or mast is made to</b></p> <p><b>(a)</b> the structure,</p> <p><b>(b)</b> one or more mechanical components, or</p> <p><b>(c)</b> the control system</p> <p>of the concrete pump, placing boom or mast, the concrete pump, placing boom or mast must be certified as safe for use by a professional engineer, the manufacturer or the manufacturer's authorized agent before it may be operated.</p>
<b>Installation of mast</b>	<b>20.48.1</b>	<p><b>The design and installation of a mast must be</b></p> <p><b>(a)</b> in accordance with the manufacturer's specifications, or</p> <p><b>(b)</b> in the absence of manufacturer's specifications, certified by a professional engineer that the mast will safely support an allowable load.</p>
<b>Boom and mast weight</b>	<b>20.49</b>	The weight of each removable section of a concrete placing boom or mast must be permanently and legibly marked on the section.
<b>Restriction on use</b>	<b>20.50</b>	<del>A concrete placing boom or mast must not be used to hoist loads.</del>
<b>Compressed air cleaning</b>	<b>20.51</b>	<p><del>(1) A concrete delivery pipe system other than an individual section of pipe may be cleaned out using compressed air, but the system must be securely anchored before such cleaning is done.</del></p> <p><del>(2) Any flexible discharge hose must be removed before cleaning out concrete delivery pipes using compressed air.</del></p>

AMENDMENTS TO PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION

- ~~(3) Only workers essential to the clean out process may be in the vicinity of concrete delivery pipes when they are pressurized with air.~~
- ~~(4) An air system being used to clean out concrete delivery pipes must have a shutoff valve.~~
- ~~(5) A trap basket must be attached to the discharge end of the concrete delivery pipe to receive the clean out ball or go-devil.~~
- ~~(6) A blowout cap must have a bleed valve to relieve air pressure in a delivery pipe being cleaned using compressed air.~~
- ~~(7) Delivery pipes must be depressurized before clamps and fittings are released.~~

<b>Operator's duties</b>	<b>20.52</b>	<del>The operator of a concrete placing boom or mast must have full control of the pump and placing equipment controls whenever the equipment is operating and engage in no other duties while operating the concrete pump and placing boom or mast.</del>
<b>Work near powerlines</b>	<b>20.53</b>	Repealed. [B.C. Reg. 312/2003.]
<b>Hopper signal device</b>	<b>20.54</b>	If a concrete placing boom operator cannot see and monitor the hopper on the concrete pump from every location the operator must be at during the pumping activity, there must be a device at the hopper for the concrete delivery truck driver and other workers to signal the pump operator if there is a problem at the pump or hopper.

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**Explanatory Notes:**

Concrete pumps and placing booms are complex pieces of equipment commonly used in construction. Concrete placing activity requires workers to be in the area of the pump and at the discharge end of a placing boom; therefore, a component failure that results in collapse of the equipment poses a high risk of serious injury to workers. While there have been no recent serious injuries or fatalities in BC as a result of a component failure, there has been a fatal accident in Alberta.

Currently, the Occupational Health and Safety Regulation ("OHSR") does not contain any specific provisions related to the design, manufacture, use, or maintenance of concrete pumps and placing booms. WorkSafeBC proposed that the Canadian Standards Association ("CSA") develop a standard for this type of equipment. The CSA recently published *CSA Standard Z151-09 – Concrete Pumps and Placing Booms* ("Standard"). WorkSafeBC participated in the development of this *Standard*.

A new section will be added to the OHSR to require that concrete pumps and placing booms must meet the requirements of the *Standard*. The *Standard* provides requirements for the design, manufacture, installation, operation, inspection, testing, and maintenance of concrete pumps, placing booms, and delivery systems. In order to eliminate conflict and redundancy between the existing regulations and the requirements of the *Standard*, certain sections of the regulations relating to concrete pumps and placing booms will be repealed or amended.

With respect to the requirements of the *Standard*, a distinction will be made between concrete pumps and placing booms manufactured before August 1, 2012 and those manufactured on or after August 1, 2012. Equipment manufactured before August 1, 2012 will not be required to meet the design, manufacture, or installation requirements of the *Standard*. The reason for this is to prevent the need to retrofit existing concrete pumps and placing booms. Concrete pumps and placing booms manufactured before August 1, 2012 will be required to meet all the requirements of the OHSR relating to concrete pumps and placing booms.

**AMENDMENTS TO PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

Concrete pumps and placing booms manufactured on or after August 1, 2012 will be required to comply with the design, manufacture, installation, operation, inspection, testing, and maintenance requirements of the *Standard*. The amendments will become effective on February 1, 2012. The date August 1, 2012 was, therefore, chosen in order to provide stakeholders with sufficient time to ensure new equipment meets the requirements of the *Standard*.

Equipment manufactured on or after August 1, 2012 will not be required to meet certain sections of the OHSR relating to concrete pumps and placing booms. The regulations from which this equipment will be exempt are those provisions relating to design, manufacture, and installation that are covered by the *Standard*. The provisions of the OHSR that do not apply to this equipment are listed in new section 20.26.2.

New section 20.26.1 [Definitions] provides a definition for the term “mast”. The *Standard* contains provisions for concrete pumps and placing booms, but it does not contain any requirements for masts. As a result, all of the requirements for masts will be contained within the OHSR. A definition for the term “mast” has been added in order to clarify what the mast is and to make it clear that the mast is not part of the placing boom.

As mentioned above, new section 20.26.2 [Application of regulation] will list the sections of the OHSR that do not apply to concrete pumps or placing booms manufactured on or after August 1, 2012. This equipment will be exempted from the sections of the OHSR listed, as the requirements in those sections are covered by the *Standard*.

Section 20.26.3 [Standards] will specify the parts of the *Standard* that apply to concrete pumps and placing booms. New section 20.26.3(1) lists the clauses of the *Standard* that will apply to concrete pumps and placing booms manufactured before August 1, 2012. Requirements that this equipment will have to comply with include those related to manuals, machine markings, emergency stops, operation, inspection, testing, and maintenance. This equipment will not have to meet the design, manufacture, or installation requirements of the *Standard*.

New section 20.26.3(2) lists the clauses of the *Standard* that will apply to concrete pumps and placing booms manufactured on or after August 1, 2012. This equipment will be required to meet all of the design, manufacture, installation, operation, inspection, testing, and maintenance requirements of the *Standard*, with a few exceptions.

Clauses 4.1.1.1, 5.3.5, 5.3.6, and 6.4.1 to 6.4.4 of the *Standard* will not apply to any concrete pumps or placing booms, whether they are manufactured before, on, or after August 1, 2012. Clause 4.1.1.1 of the *Standard* requires a manufacturer to perform a design review to confirm that a placing boom and structural support system has been constructed to meet its intended purpose. This requirement cannot be met without conducting destructive testing and therefore cannot reasonably be complied with. Rather than adopting this requirement, a new requirement has been added to the OHSR which will meet the intended purpose of clause 4.1.1.1, but which can reasonably be complied with (see section 20.30.1). Clauses 5.3.5 and 5.3.6 of the *Standard* relate to repairs; requirements for repairs to equipment are dealt with by section 20.48 of the OHSR. Clauses 6.4.1 to 6.4.4 of the *Standard* relate to operating near electrical power lines; requirements for operating near power lines are dealt with by section 19.24 of the OHSR.

Section 20.27(1) [Equipment identification] will be amended so that this section will no longer apply to concrete pumps or placing booms, but will only apply to masts. This regulation will no longer apply to concrete pumps or placing booms as the requirement for this equipment to have identification plates is contained in clauses 4.2.1.1 and 4.2.2 of the *Standard*. Section 20.27(2) will be repealed as it is no longer necessary.

Section 20.28 [Manufacturer's manual] has been amended in order to achieve consistency with terminology used in the *Standard*. This section is also being amended to make it clear that the manual referred to in proposed section 20.28(1) must include all of the information required by clause 4.1.18.1 of

**AMENDMENTS TO PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

the *Standard*. As clause 4.1.18.1 of the *Standard* only applies to documentation for concrete pumps and placing booms, a separate section [section 20.28(2)] will be included in the OHSR to specify the requirement for the manual and instructions for a mast to be made available.

A minor amendment has been made to section 20.29 [Inspection and maintenance records]. The phrase "in this regulation" will be added to clarify that this section is referring to Part 4 of the OHSR. Also, this section will be amended to clarify that it applies to a concrete pump, in addition to a placing boom and mast.

Minor wording changes have also been made to section 20.30 [Pre-use inspection]. Each subsection has been amended to make it clear that the requirements apply to concrete pumps, placing booms, and masts. Currently, this section does not make it clear that the requirements for pre-use inspection also apply to concrete pumps. In addition, section 20.30(1) will be amended to replace the word "or" with the word "and"; the purpose of this amendment is to clarify that a concrete pump, placing boom, and mast must all be inspected before use on each shift.

New section 20.30.1 [Design and construction] is being introduced in order to address the intent behind clause 4.1.1.1 of the *Standard*. As stated above, clause 4.1.1.1 of the *Standard* is unenforceable, because meeting this requirement would necessitate destructive testing of equipment. Clause 4.1.1.1 of the *Standard* is, therefore, not being adopted. Instead, section 20.30.1 will be introduced to ensure that equipment is manufactured to meet its intended purpose.

Section 20.31 [Controls] is also being amended to clarify that it applies to controls for a concrete pump as well as to controls for a placing boom or mast. The regulation has also been amended to clarify that the controls for a concrete pump, placing boom or mast must be located and maintained to allow safe operation of the equipment.

Section 20.31 will only apply to concrete pumps and placing booms manufactured before August 1, 2012. The control requirements for equipment manufactured on or after August 1, 2012 will be governed by clauses 4.1.8.1 to 4.1.9.1.6 of the *Standard*.

A minor amendment has been made to section 20.32(2) [Hydraulic cylinders] in order to clarify that this section applies to a concrete pump in addition to a placing boom and mast. The rest of this section remains unchanged. However, this section will not apply to concrete pumps or placing booms manufactured on or after August 1, 2012 as the requirements for hydraulic cylinders are covered by clause 4.1.13.5 in the *Standard*.

No changes have been made to sections 20.33 [Marking weight], 20.34 [Lifting a pump], or 20.35 [Securing a pump]. These sections will continue to apply to all concrete pumps and placing booms.

Section 20.36 [Emergency shutoff], which requires that a concrete pump have an emergency stop switch near the hopper, is being repealed. This requirement is covered by clause 4.1.9.2.3 in the *Standard*. Clause 4.1.9.2.3 requires that emergency stop actuators be installed on each side of the hopper. This is a stronger requirement than that currently in the OHSR. All equipment will be required to comply with clause 4.1.9.2.3, even equipment manufactured before August 1, 2012. This may result in the need to retrofit some existing equipment.

Section 20.37 [Agitator guarding] will remain the same; however, this section will only apply to equipment manufactured before August 1, 2012. Equipment manufactured on or after this date will be required to comply with the requirements for guarding contained in clauses 4.1.20.1 to 4.1.20.4 of the *Standard*.

Section 20.38 [Engine exhaust] will retain its current wording; however, this section will only apply to equipment manufactured before August 1, 2012. Equipment manufactured on or after this date will be required to comply with clause 4.1.19.3 of the *Standard*.

**AMENDMENTS TO PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

No changes have been made to section 20.39 [Housekeeping]. This section will continue to apply to all concrete pumps and placing booms.

A minor amendment has been made to section 20.40 [Outriggers]. The term “mast” is being removed from this section, as the requirements do not apply to masts. Sections 20.40(1) and 20.40(2) will continue to apply to all concrete pumps and placing booms. Section 20.40(3) will only apply to equipment manufactured before August 1, 2012. This requirement is contained in clause 4.1.7.4 of the *Standard*, which will apply to equipment manufactured on or after August 1, 2012.

section 20.41(3) [Use of placing boom] is being repealed, as this requirement is contained in clause 6.3.1(d) of the *Standard*. It is not necessary to duplicate this requirement in the OHSR.

A minor amendment has been made to section 20.42 [Pipe diameter and thickness]. The term “mast” has been removed from this section, as the requirements do not apply to masts.

No changes are being made to the wording of section 20.43 [Pipe clamps]. Sections 20.43(1), 20.43(2), and 20.43(3) will continue to apply to all concrete pumps and placing booms. Section 20.43(4) will only apply to equipment manufactured before August 1, 2012. Equipment manufactured on or after August 1, 2012 will be governed by clause 4.1.15.1 of the *Standard*.

No changes are being made to section 20.44 [Delivery pipe]. This section will continue to apply to all concrete pumps and placing booms.

No changes are being made to the wording of section 20.45 [Restraining devices]. However, this section will only apply to concrete pumps and placing booms manufactured before August 1, 2012. Clause 4.1.14.1 of the *Standard* contains the exact same requirement; this clause will govern concrete pumps and placing booms manufactured on or after August 1, 2012.

No changes are being made to section 20.46 [Concrete pump lines]. This section will continue to apply to all concrete pumps and placing booms.

The *Standard* contains requirements for both the frequent and periodic inspection of concrete pumps and placing booms (see clauses 5.2.1 to 5.2.4 of the *Standard*). Consequently, section 20.47(1) [Equipment inspection] has been amended to remove the phrase “concrete placing boom”; this section will only apply to masts.

Section 20.47(2) has been added to the OHSR. Current section 20.47 requires that a concrete placing boom be inspected at least every 12 months and be certified as safe for use by a professional engineer, the manufacturer, or the manufacturer’s authorized agent. The *Standard*, however, does not require that periodic inspections be carried out by someone with one of the aforementioned qualifications. Section 20.47(2) will clarify that, for the purposes of clauses 5.2.2.2.1 to 5.2.2.2.2 of the *Standard*, a qualified person is defined as a professional engineer. The purpose of this amendment is to ensure that periodic inspections continue to be carried out by someone with the appropriate qualifications.

A minor amendment is being made to section 20.48(1), to clarify that this section applies to concrete pumps, as well as to placing booms and masts.

Two subsections are being added to section 20.48 [Repair and modification], related to repairs and modifications to concrete pumps, placing booms, and masts. New section 20.48(2) will specify the requirements to be met when repairs are made to load bearing components of equipment, and new section 20.48(3) will specify the requirements to be met when modifications are made to equipment. The requirements related to repair of concrete pumps and placing booms contained in the *Standard* will not apply; rather, repairs will be governed by section 20.48 of the OHSR. Consequently, it is necessary to strengthen the regulations related to repair.

**AMENDMENTS TO PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

Section 20.48.1 [Installation of mast] is being added to the OHSR to require that a mast must be designed and installed according to the specifications of the manufacturer. In the absence of a manufacturer's specifications, the design and installation must be certified by a professional engineer to ensure that it is structurally adequate. This would cover the design and installation of towers and other means of supporting placing booms. In adopting the *Standard*, the requirements for concrete pumps and placing booms are being strengthened. However, the standard does not contain any requirements relating to masts. It is proposed to strengthen the current regulations relating to masts for consistency.

No changes are being made to section 20.49 [Boom and mast weight]. This section will continue to apply to all concrete pumps and placing booms.

Section 20.50 [Restriction on use] is being repealed, as this requirement is contained in clause 6.3.1(a) of the *Standard*. It is not necessary to duplicate this requirement in the OHSR.

Section 20.51 [Compressed air cleaning] is being repealed, as this requirement conflicts with clause 6.5.2 of the *Standard*, which prohibits the use of compressed air to remove a blockage in a delivery system. Cleaning of the boom pipeline will be governed by clauses 6.5.1 to 6.5.3 of the *Standard*.

Section 20.52 [Operator's duties] is being repealed, as requirements for operator conduct are contained in clause 6.2 of the *Standard*. It is not necessary to duplicate this requirement in the OHSR.

No changes are being made to section 20.54 [Hopper signal device]. This section will continue to apply to all concrete pumps and placing booms.