

Frequently Asked Questions

Professional Engineers

PEO REVISED TOWER CRANE INSPECTION PRACTICE STANDARD

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Rationale, Timing and Compliance

- 1. What are the major new requirements involving tower crane inspections by professional engineers in Ontario in O. Reg. 213/91 under the Occupational Health and Safety Act?
 - Addition of electrical, mechanical, hydraulic and control components to be inspected;
 - Addition of self-erecting and travelling base tower cranes;
 - Addition of annual inspections of in-use tower cranes;
 - Updated reference to CSA and ESA technical standards;
 - Replacement of "competent person" with "person directed by an engineer" to perform part of some tower crane inspections; and
 - Additional requirement in inspection reports for the engineer to confirm all components are in "adequate condition".

2. Why were the changes to tower crane inspection requirements made?

On August 8, 2023, the Ontario Ministry of Labour, Immigration, Training and Skills Development (MLITSD) published changes to its regulations to improve crane safety on construction sites to keep workers and the public safe and avoid work stoppages. The amendments apply to all construction projects where tower cranes may be used and where the **O. Reg 213/91: Construction Projects made under the** *Occupational Health and Safety Act* applies. For more information, see the article <u>Province Updates Regulatory Requirements for Cranes at</u> <u>Construction Projects</u> (*Engineering Dimensions*, Spring 2024).

3. When did the changes come into effect?

While O. Reg 213/91: Construction Projects made under the *Occupational Health and Safety Act* came into effect on January 1, 2024, O. Reg 260/08: Performance Standards made under the *Professional Engineers Act* came into effect on December 13, 2024. Further changes to O. Reg 213/91 came into effect on January 1, 2025 (notably, inspections of tower cranes older than ten years) but they *do not* involve PEO's performance standards). For information on the January 1, 2025 changes, please see the Ministry of Labour, Immigration, Training and Skills Development's <u>Tower Crane Safety web page</u> and <u>Changes to Requirements Related to Cranes Used at Construction Projects</u>.

4. Where can I find a copy of O. Reg. 213/91 and PEO's revised practice standard?

For a printable digital copy of O. Reg. 213/91, go to e-Laws: <u>O. Reg. 213/91: CONSTRUCTION PROJECTS</u> (ontario.ca)

For a printable digital copy of PEO's revised Practice Standard, go to https://www.peo.on.ca/sites/default/files/2025-01/eng-inspection-tower-crane.pdf

5. Why does PEO's practice standard only deal with certain sections of O. Reg. 213/91? Are engineers still required to comply with the rest of O. Reg. 213/91?

Since only sections 158, 159 and 165(3) of O. Reg. 213/91 require an engineer to perform tower crane inspections "in accordance with the performance standards as prescribed by Ontario Regulation 260/08 (Performance Standards) made under the *Professional Engineers Act*," PEO has revised its current practice standard to provide the inspection requirements. The Performance Standard for Tower Cranes in O. Reg. 260/08 refers to the practice standard as published by PEO.

Other parts of O. Reg. 213/91 are still applicable to engineers, where relevant, but as they do not specify engineering performance standards, they were left out of the revised practice standard. **However, engineers** are still required to comply with all relevant sections of O. Reg. 213/91.

Under section 72(2)(d) of Regulation 941 (professional misconduct), engineers are required to "make responsible provision for complying with applicable statutes, regulations, standards, codes, by-laws and rules in connection with work being undertaken by or under the responsibility of the practitioner" and to comply with O. Reg. 260/08 (Performance Standards). Failure to do so may result in PEO disciplinary proceedings. "Regulations" applies equally to O. Reg. 213/91 and O. Reg. 260/08 (Performance Standards, Part IV- Tower Crane Inspections).

6. What changes did PEO make to its 2015 Tower Crane Review practice standard?

PEO has made necessary changes to align its practice standard with the new requirements of O. Reg. 213/91 that require a performance standard for engineers performing tower crane inspections. New sections were required to address inspection standards for self-erecting tower cranes, climbing systems, tower cranes mounted on a travelling base, as well as for annual inspections of in-use tower cranes and their climbing systems.

Technical changes to inspection performance standards reflect the CSA Z248-17 Standard, ESA Spec 009-RO, and generally accepted industry practices. Most notably, standards are included for qualified inspection or repair personnel such as qualified technicians, qualified electricians, master electricians and qualified non-destructive testing (NDT) technicians directed by an engineer to perform parts of inspections or repairs. PEO also clarified the source for requested documentation and reports, the responsibilities of crane owners, and added subheadings for easier location of inspection stages and components.

Note: The above paragraphs are only a summary of the major changes; the practice standard (<u>https://www.peo.on.ca/sites/default/files/2025-01/eng-inspection-tower-crane.pdf</u>) should be reviewed in its entirety.

7. How did PEO consult with the tower crane industry and practitioners in revising the practice standard?

PEO consulted with the tower crane industry from January to August 2024. PEO met with manufacturers, relevant industry regulators and tower crane providers, including professional organizations. PEO also consulted with certificate of authorization holders whose engineering scope of work includes tower crane design or inspection to receive their feedback, which was reviewed to further refine PEO's documents.

Who is Qualified to Perform Tower Crane Inspections?

8. Why was the term "review engineer" changed in the practice standard?

Until January 1, 2024, O. Reg. 213/91 only required engineers to perform structural inspections; and accordingly, the 2015 version of the PEO practice standard used the term "review engineer".

The changes to subsection 158(1) of O. Reg. 213/91 added inspections of electrical, mechanical and hydraulic components and their control systems to structural ones. Since the scope of tower crane inspection is now likely wider than those that can be competently performed by one engineer, and one engineer cannot assume responsibility for work outside of their area of competency, it is necessary to allow for multiple inspections of different components to be done by different engineers, and reported in combination to the tower crane owner.

9. Who is defined as an "engineer" in the revised PEO practice standard?

O. Reg. 213/91 refers to an "engineer", as defined in section 1 of the *Occupational Health and Safety Act* (OHSA), as "...subject to any prescribed requirements or restrictions, a person who is licensed as a professional engineer or who holds a limited licence under the *Professional Engineers Act*; ("ingénieur")"¹. This means that <u>only</u> holders of a professional engineer (**P.Eng.**) license or a limited license (LEL) can perform the duties required of an engineer in **O. Reg. 213/91**.

10. Can limited licence holders perform tower crane inspections?

Yes, limited licence holders can perform tower crane inspections within their scope of services specified in the licence issued by PEO. Limited licence holders can also direct unlicensed persons if their scope of practice fully encompasses the scope of the inspection.

11. Can temporary licence holders perform tower crane inspections?

Since the definition of "engineer" in the *Occupational Health and Safety Act* does not include temporary licence holders, they are now <u>prohibited</u> from performing tower crane inspections.

12. I am a structural engineer performing tower crane inspections. How do I now do inspections related to electrical or mechanical components?

Engineers are restricted to practice only within their areas of competency. If mechanical or electrical engineering is outside of that area, you must notify the crane owner of this, and the crane owner will need to find other engineer(s) with competency in those areas to conduct inspections of those components. You may only **ensure** that inspections related to other disciplines are completed, in accordance with the performance standards process. However, you are not responsible for the content of those reports themselves, even if the name of the directed person is in the written inspection form.

13. I am a mechanical or electrical engineer. What do I need to know to be able to perform inspections of these components of tower cranes?

Engineers are restricted to practice only within their areas of competency. They must be familiar with and able to comply with the requirements of O. Reg. 213/91, relevant technical standards such as CSA Z248-17 **and** Electrical Specification Tower Cranes, ESA SPEC-009 R0, Electrical Safety for Tower Cranes (for electrical components), as well as PEO's practice standard.

Also, on Part B under "Review of Electrical components" (sec. 12-14), an electrical engineer is required to do those inspections within their area of competency, while under "Review of Mechanical Components" (sec. 15-20), a mechanical engineer is required to do those inspections within their area of competency.

Mechanical or electrical engineer(s) who cannot take responsibility for reports under their area of competency may only **ensure** that inspections related to other disciplines are completed.

14. If more than one engineer is now performing inspections on tower crane components (within their specific area of competency), how is this to be done, and how are reports to be submitted?

Where a written inspection report being submitted by an engineer includes sections or portions that were prepared by other engineers (such as in the case where other engineers with the relevant competencies performed parts of the inspection), or person(s) directed by them, the engineer submitting the report should ensure all sections and parts of the report have been properly organized and **compiled into a single final inspection** report/or file for the tower crane.

Also, a note has been added to the practice standard for this purpose: "Reference to the singular (for example, "engineer" or "person directed by the engineer") includes reference to the plural and vice versa or "he/she" or "they", are taken as interchangeable and therefore as referring to same." This allows for multiple engineers to perform inspections of different tower crane components within their respective competency.

Engineer(s) who cannot take responsibility for reports under their area of competency may only **ensure** that inspections related to other disciplines are completed.

Directing Other Persons to Perform Inspections

15. What does "direction" to perform tower crane inspections mean? Who can be directed, and how?

As allowed by subsections 158(3) and 159(2) of O. Reg. 213/91, the engineer performing the inspection may direct a person who is not a professional engineer or limited licence holder to carry out one or more of the functions described in Parts A, B, C or D (but not E) where it is consistent with prudent engineering practice to do so and the functions are performed under the direction of the engineer in accordance with the practice standard.

In various places, the revised practice standard indicates which inspections and duties can be directed to other professionals. Directed persons can include "qualified technicians", qualified NDT technicians, qualified electricians or master electricians. More detail on who can be directed and how to direct them may be found in sections 4.1, 4.2, 4.3, 4.4 and 4.5 of the revised <u>Practice Bulletin #7</u>.

When providing direction to non-engineering professionals, the engineer must ensure that the inspections are completed in accordance with the requirements of the original equipment manufacturer (OEM) and the inspections requirements stated in CSA Standard Z248-17. The engineer must direct the inspection personnel **on the specific inspection requirements** to be performed by referencing the **specific section of the CSA Standard Z248-17 or those found in OEM maintenance manuals, service bulletins or modifications.**

The engineer may also direct a person who is not a licensed engineer to perform all or part of the inspection that not limited to within the engineer's area of competency

16. Can technicians continue to perform some parts of tower crane inspections?

Generally, yes, under the definition of "qualified technician" in the practice standard (if they are qualified and directed by an engineer within that engineer's area of competency.) As there are no standardized certifications for technicians, it is **now the responsibility of the tower crane owner, operator or OEM**, not the engineer, to determine that the person is qualified within their scope of competency. Parts A, B, C and D of the practice standard details who can be directed to perform certain inspections, what their qualifications are, and how they are to carry out the inspection and report back to the engineer with their findings.

17. If the engineer is not certified to CGSB 48.9712, can they perform non-destructive testing (NDT) inspections?

No, the engineer may not perform non-destructive testing (NDT) if they are not certified to CDSB requirements. An engineer may perform the NDT inspection **only** if they are certified to CAN/CGSB 48.9712-2014 or an amended version of this standard that was in effect at the time of certification, or direct a qualified NDT technician to perform the NDT inspection.

18. What does a "qualified technician" mean for tower crane inspections?

A "qualified technician" means a person qualified as competent by a tower crane owner, client, operator or original equipment manufacturer (OEM) through their training and experience to perform maintenance of components of a tower crane, and who carries out such work on an ongoing basis for a tower crane owner or OEM. As there are no standardized certifications for these technicians, it is now the responsibility of the tower crane owner, operator or OEM, and not the engineer, to determine that the person is qualified. "Qualified technicians" must be directed by an engineer.

A qualified technician can be directed for repair with OEM part(s), but not for replacement or modification of original parts.

The engineer should ensure qualified technicians are competent to fulfill the inspections based on experience, credentials, knowledge or combination of each of the following: "qualified technicians", qualified NDT technicians, qualified electricians, or master electricians, if the engineer unfamiliar with them, or is not from the discipline related to the technician, the engineer will address the decision of qualifying the technicians to the owner or a higher level under the supervision of the owner.

19. Why is "qualified mechanic" not defined in the practice standard?

A "qualified mechanic" is one example of a "qualified technician". Since section 158(1) of O. Reg. 213/91 now requires inspection of electrical, hydraulic and mechanical components and control systems, it was necessary to broaden the definition to include a wider range of directed qualified persons.

20. How is an engineer to address reports from qualified technicians or other directed persons where it is outside of the engineer's area of competency?

Reports produced by qualified personnel do not need to be independently validated by the engineer if the area of practice is not within the engineer's discipline or competency. In these cases, the engineer only needs to ensure the inspections and reports have been completed for the process.

Note: The engineer only assumes all responsibility for the engineering work carried out for each inspection within his or her competency. Where the work is outside of the engineer's competency, the engineer must only ensure that inspections related to other disciplines are completed by directed persons in accordance with the performance standards process, but is not responsible for the content of those reports themselves.

Addressing Component Modifications and Defects

21. Why was the section on modifications added to the practice bulletin?

Modifications, such as repairs, replacements or upgrades of components, is a common occurrence for tower crane equipment and can increase the safety risk. Section 95 of O. Reg. 213/91 requires that:

(1) every replacement part for a vehicle, machine, tool or equipment shall have at least the same safety factor as the part it is replacing, O. Reg. 213/91, s. 95 (1). and

(2) No modification to, extension to, repair to or replacement of a part of a vehicle, machine, tool or equipment shall result in a reduction of the safety factor of the vehicle, machine, tool or equipment. O. Reg. 213/91, s. 95 (2).

In the course of its review of the current practice standard, PEO identified that inspection of modifications must be included to improve public safety, and therefore added section 3.4 of the revised *Practice Bulletin* #7. During the process of inspecting a tower crane or its components, the engineer may encounter a modification to the crane. The modification may come about as a result of the initial maintenance documentation review or is discovered during the inspection of the tower crane components. The practice standard adds details on how an engineer is to deal with inspecting modifications, in Part A section (1) (xix) and (41)(p); Part B in section (1) (xix), section (11) and section (21) (o); and Part D (1) (ix).

If the repair was completed by a qualified technician, has no modifications, and is back to OEM specifications, the engineer who certifies the repair must be within the area of competency of the repair.

22. Are electrical engineers required for tower crane inspection(s) and/or sign off(s) of electrical modifications?

As per Part A of the practice standard, subsection (1)(xix) and CSA Z248 section 4.2 "Modifications and changes in design", as long as no modification to the tower crane's electrical components was made (as per the definition at section 3.4 of the practice bulletin) after initially obtaining the ESA certification (SPE1000), an electrical inspection by an engineer is not required for approval for the same approval of ESA SPEC-009-R0 by the Electrical Safety Authority or any unmodified electrical replacement which do not relate to original OEM or the electrical design.

Therefore, a master electrician, qualified electrician or qualified technician can approve the **unmodified** condition of a tower crane's electrical components, with applicable and current documentation and certification. Each electrical inspection must follow CSA Z248-17, specifically sections 8.3.2 "Preoperational inspection and test", 8.3.3 "Limit switches and safety devices", and 8.3.4 "Power supply".

If **modifications have been made** to the electrical components since the initial ESA certification, an electrical engineer is required to inspect or direct other qualified personnel to inspect the electrical components, new design and testing reports to verify compliance with ESA and safe compliance.

Note: in Part B under "Review of Electrical components" (sec 12-14), an electrical engineer is required to do those inspections.

23. Does the engineer need to provide a report verifying that all defects have been corrected before the tower crane is erected?

Yes, the engineer must verify that all defects have been corrected, as per Part A section (21), Part B section (23), and Part D section (14). If they have not been corrected, the engineer must notify the tower crane owner. The tower crane cannot be erected until the defects are corrected to the engineer's satisfaction.

Written Inspection Report Requirements

24. What are the new requirements for written inspection reports?

Written inspection reports for tower cranes are required under O. Reg. 213/91 at the pre-erection and posterection stages, (but prior to use)(Part A), for climbing systems (Part C) prior to each use; for self-erecting tower cranes (Part D); and now at the annual in-use stage (Part B). A standardized inspection report format should be implemented for the initial, periodic and annual inspections to enable consistency across different assessments, making it easier to track over time.

The findings shall be presented to the tower crane owner in a clear, logical format that identifies any deficiencies in reports or findings that require immediate action as soon as possible. Inspections shall only continue after the tower crane owner corrects the identified deficiencies.

25. Do Tower Crane Practice Standard written inspection reports need to comply with CSA, OEM and regulatory standards and codes?

Yes, as described in Part A section 41(s), and Part B section 21(q), the engineer must provide a report verifying that all defects have been corrected according to CSA, OEM and regulatory standards and codes before the crane is erected.

26. Engineers are now required in their inspection report to confirm that components are in "adequate condition". As an engineer, what does this require me to do?

Subsections 158(3) and 159(2) of O. Reg. 213/91 include a requirement for the engineer to confirm "that all components are in adequate condition" in his or her written inspection report.

Subsection 158(4)(b) of O. Reg. 213/91 has a similar requirement regarding corrections and repairs of identified defects:

(4) A tower crane shall not be used until,

(a) any defects identified in the inspection have been corrected or repaired in accordance with the instructions of the tower crane manufacturer or an engineer; and

(b) the tower crane has been inspected by an engineer and the engineer has prepared a written report of the corrections, repairs and results of the inspection confirming that any defects identified have been corrected or repaired and that **the corrected or repaired components are in adequate condition**. O. Reg. 241/23, s. 14.

Confirmation generally means to audit the accuracy, validity or genuineness of the inspection findings completed and documented by all involved parties in order to state the work has been comprehensive and satisfies the inspection requirements described in CSA Z248-17 and by the OEM.

"adequate" is already defined in subsection 1(1) of O. Reg. 213/91:

"adequate", in relation to a procedure, plan, material, device, object or thing, means,

- (a) sufficient for both its intended and its actual use, and
- (b) sufficient to protect a worker from occupational illness or occupational injury,

and "adequately" has a corresponding meaning; ("adéquat", "adéquatement")

Written inspection reports for post-erection, annual in-use, climbing systems, and self-erecting tower cranes must include a statement that the tower crane is "ready to be put into service, including confirmation that all

components comply with this Practice Standard, CSA Standard Z248-17 and OEM specifications, are in adequate condition, is ready to put into service with specific limitations, or is not ready to be put into service due to specific deficiencies."

Annual In-Use Inspections

27. For annual inspections of in-use tower cranes (Part B of the practice standard), what is the effective date of the first annual inspection?

Section 159(1) of O. Reg. 213/91, as it read on December 31, 2023, required that:

159. (1) An engineer or a competent worker designated by an engineer shall visually inspect for defects the structural elements and components of a tower crane,

(a) after the crane is erected and before it is used; and

(b) after the inspection under clause (a), **at intervals not greater than twelve months**. O. Reg. 213/91, s. 159 (1); O. Reg. 375/22, s. 5.

As of January 1, 2024, the Ministry added a requirement for the same intervals for **all tower cranes** in paragraphs 1iii. and 2ii of Section 158(1) of O. Reg, 213/91, which now includes electrical, mechanical and hydraulic components, as well as controls systems in addition to structural components, and for climbing systems under subsection 159(1)(b) of O. Reg. 213/91.

Therefore, annual inspections continue for structural components, and as of January 1, 2024, for all other components and control systems, as well as climbing systems.

Climbing System Inspections

28. What are the new inspection requirements for climbing systems (Part C)?

The inspection of the climbing system is given more importance as a critical life safety system in the revised practice standard and therefore require more detailed and elaborated inspection requirements.

The inspection of climbing system equipment is to be performed in addition to the requirements of Parts A and B, and **prior to each use** of the climbing system [as is also required on ss.159 (1)(b) for climbing systems as per CSA Standard Z248-17, section 5.9.8.8 "Climbing section"]. The expectation of inspection **prior to each use** is a higher inspection frequency than those described in annual inspections of Parts A and B above. As such, the requirement for inspection prior to each use may require these components to be inspected **more frequently than the annual interval**.

29. When are engineers required to inspect the installation of the climbing system in Part C?

Under section 157 of O. Reg. 213/91, engineers are required to initially inspect the foundation, shoring and bracing components and tie-ins for a climbing system, *prior to the initial climbing operation.*

PEO's practice standard only requires an engineer (or a person directed by them) to inspect the climbing system prior to the initial climbing operation of the tower crane at the project and at intervals not greater than 12 months while the tower crane is erected at a project as per subsection 159(1)(a) and (b).

Self-erecting Tower Crane inspections

30. What are "self-erecting" tower cranes? Why were they added to the practice standard? Where can I find technical guidelines on them?

A self-erecting tower crane can be erected without the use of ancillary equipment. While self-erecting tower cranes are not new, the Ministry added a definition in section 1(1) for this type of tower crane, as well as its inspection requirements before the crane is put into service for the first time in section 158(1) paragraph 2 of O. Reg. 213/91. After that first inspection, inspections must be conducted:

- at least once every 12 months while the crane is in use at a project;
- after every 12 erections of the crane; or
- as often as is recommended by the crane manufacturer, whichever occurs first.

As per the new requirement in section 158 of O. Reg. 213/91, the inspection standards for self-erecting tower cranes are prescribed in O. Reg. 260/08 (Performance Standards) under the *Professional Engineers Act*), which refer to the PEO Practice Standard on Tower Crane Inspections.

Tower Cranes Mounted on a Travelling Base

31. Why was this type of tower crane added to the practice standard (Part E)? Can an engineer direct another person to do this inspection?

As per the new requirement in section 165(3) of O. Reg. 213/91, the inspection standards for tower cranes mounted on a travelling base are prescribed in O. Reg. 260/08 (Performance Standards) under the *Professional Engineers Act*), which refer to the PEO Practice Standard on Tower Crane Inspections. However, **only engineers can perform these inspections; they <u>cannot</u> direct other professionals to inspect these types of tower cranes.**

Responsibilities of Tower Crane Owners, operators and others in supporting Tower Crane inspections

32. What is the role of a tower crane owner, operator, contractor, general manager (etc.) with respect to individuals performing tower crane inspections?

Tower crane owners are ultimately responsible for the safe operation of their tower cranes. There are many individuals involved in the safe erection and operation of a tower crane. Owners must hire engineers to ensure that tower crane inspections are done in accordance with PEO's performance standards. Within the practice standard, owners are generally required to provide necessary documents to an engineer or to receive reports from an engineer. When tower crane owners, clients or operators hire technicians to perform maintenance or inspections, they are now required to determine that a technician is qualified as competent through their training and experience to perform the work on specific components of a tower crane, but their work must still be directed by an engineer.

33. Does PEO set fees for tower crane inspections?

No, fees are negotiated between tower crane owners and engineers. Fees should reflect the scope and frequency of inspections, including the new requirements for annual inspections, self-erecting tower cranes, tower cranes on a travelling base, and submitting written inspection reports at the required times.

34. How much "out of service" time will the additional inspection requirements require?

It is difficult to predict the amount of "out of service" time for inspections, as there are many variables impacting the time required to complete tower crane inspections, such as;

- The age of the tower crane:
- The type of tower crane:
- The availability of records and documents, including manufacturer's information, crane log books, and previous inspection reports;
- The number and type of modifications made or subsequently discovered;
- The type of inspection (pre-erection, post-erection, or in-use);
- The area(s) of competency of the engineer contracted to perform the inspection;
- The extent of direction to unlicensed persons by an engineer and their availability;
- The inspections findings and any necessary repairs or parts replacements to ensure that all components are in adequate condition;
- The time needed for the engineer to prepare and submit the inspection report(s); and weather conditions.

Additional Resources

35. Where can I get more information from the Ministry of Labour, Immigration, Training and Skills Development on tower crane safety?

For more information, go to the Ministry's web page for Tower Crane Safety at

English: https://www.ontario.ca/page/technical-guideline-requirements-cranes-construction-projects

French: <u>https://www.ontario.ca/fr/page/lignes-directrices-techniques-sur-les-exigences-relatives-aux-grues-dans-les-projets-construction</u>

PEO has published additional materials to learn more about changes to its practice standard, which can be found on PEO's website: https://www.peo.on.ca/knowledge-centre/practice-advice-resources-and-guidelines

For personal practice advice related to the practice standard or for further information, please contact PEO's Practice Advisor at practice-standards@peo.on.ca