

TENDER DOCUMENTS

SUBSECTION 6.15 SCAFFOLDING, PLATFORMS AND OTHER TEMPORARY DEVICES

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SUBSECTION 6.15 SCAFFOLDING, PLATFORMS AND OTHER TEMPORARY DEVICES

6.15.1 GENERAL

- 6.15.1.1 This subsection sets out the requirements respecting the design, supply, installation, inspection and maintenance by the **Contractor** of all temporary devices such as platforms, walkways, scaffolding, staircases, ladders, access devices, barges or other floating plant, enclosures, formwork, bracing, supports and other temporary works necessary for the safe and expeditious performance of the work and to allow the **Owner** and its representatives to monitor the work.
- 6.15.1.2 The access devices provided by the **Contractor** shall include devices such as cranes and work platforms, or elevating work platforms, staircases, walkways or other access devices in order to provide access to the work areas at all times for the workers, the Engineer, inspectors and any other representative of the Engineer.
- 6.15.1.2.1 The **Contractor's** employees shall not walk directly on the chords of the bridge unless walkways or other access devices are added.
- 6.15.1.2.2 The **Contractor's** employees shall not walk in open traffic lanes. The **Contractor** shall provide safe access to the various platforms and enclosures.

6.15.2 REFERENCE STANDARDS

- 6.15.2.1 With due regard for the specific nature of the work site, the **Contractor** shall design, erect, maintain and use all the temporary devices in strict compliance with federal, provincial or other applicable standards, codes, regulations and legislation, and to the complete satisfaction of the competent bodies, including the Commission de la santé et de la sécurité du travail (CSST) du Québec.
- 6.15.2.2 When the Engineer so requests, the **Contractor** shall demonstrate to him that all of the legal and contractual requirements respecting temporary devices are being complied with.

6.15.3 EXECUTION OF THE WORK

6.15.3.1 TEMPORARY DEVICES

- 6.15.3.1.1 The **Contractor** shall design, supply, construct and maintain all the temporary devices required to carry out the work safely and expeditiously.
- 6.15.3.1.2 The **Contractor** shall supply access devices that are sufficiently large and solid to safely accommodate the staff of the **Contractor**, the **Owner** and its representatives at all times, especially for the purpose of conducting a detailed inspection of the work site and the work.

- 6.15.3.1.3 When necessary, the **Contractor** shall erect temporary devices to allow pedestrians and cyclists to use the sidewalks and cycling paths unhindered.
- 6.15.3.1.4 If the **Contractor's** initial proposals for temporary devices, submitted as part of the bid and upon which the **Contractor** was authorized to proceed with the work, prove ineffective or do not comply with the safety requirements of the **Owner**, the **Contractor** shall modify them to the satisfaction of the Engineer so that they comply with these requirements, at no additional cost to the **Owner**.
- 6.15.3.1.5 The **Contractor** shall take steps to ensure that the temporary devices are inaccessible to the public. The **Contractor** shall also ensure that the public does not have access to any cables suspended from the temporary devices.
- 6.15.3.1.6 Fourteen (14) days before the rigging takes place, the **Contractor** shall supply the Engineer with a copy of the drawings, data sheets and design notes for the temporary devices that were forwarded to the CSST. The documents provided shall clearly indicate how and in what order all of the temporary devices shall be installed and moved and how they shall be disassembled.
- 6.15.3.1.7 The design of the temporary devices, including the drawings, shall comply with the requirements of the Commission de la santé et de la sécurité du travail (CSST) the *Quebec Construction Code – Chapter 1, Building*, the *National Building Code of Canada 2005* and to the CSA Standards for the construction materials to be used and shall be submitted to the CSST and to the Engineer for review and comments.
- 6.15.3.1.7.1 Without limiting the scope of paragraph 6.15.3.1.6 at the latest, within fourteen (14) days of the written notification of Contract award, the **Contractor** shall submit the drawings and design notes for the temporary devices and the data sheets of all components such as the cables and trusses used to construct them to the Engineer for comment and review. The **Contractor** shall not start constructing the enclosures, scaffolding, walkways and other access devices until he has received the Engineer's comments.
- 6.15.3.1.7.2 The **Contractor's** schedule shall allow enough time for conducting all checks and obtaining all authorizations that are required.
- 6.15.3.1.7.3 The drawings shall indicate the dimensions and specifications respecting the components and, materials and the design loads that are used, permissible load combinations and information about splicing and fastening devices, including nails, staples and other joining devices.
- 6.15.3.1.7.4 The drawings and design notes for the temporary devices shall bear the seal and signature of the engineer/designer responsible for their design, who shall be a member in good standing of the Ordre des ingénieurs du Québec and have at least eight (8) years of relevant experience.
- 6.15.3.1.7.5 Any on-site modifications of the temporary devices shall be approved by the **Contractor's** engineer/designer.

- 6.15.3.1.7.6 Throughout the entire course of the work, which includes, but is not limited to, the use and dismantling of the temporary devices, all temporary facility parts and components shall be attached in such a way as to prevent them from becoming displaced or falling.
- 6.15.3.1.7.7 Unless there is a written directive from the **Contractor's** engineer/designer, the total thickness of shims used for on-site adjustments during construction of enclosures, scaffolding, walkways and other access devices shall not exceed 150 mm.
- 6.15.3.1.7.8 Shims shall be attached at all times to prevent them from becoming displaced as a result of vibrations or any other cause.
- 6.15.3.1.8 The temporary devices shall be constructed in accordance with the *Contractor's Drawings* and as directed by the Engineer. The **Contractor** shall allow a minimum of fourteen (14) days for the Engineer to examine the *Contractor's Drawings* for the platforms, scaffolding, and other access devices before starting the construction of the enclosures, scaffolding and walkways in accordance with article 5.14.2 *Elements to be considered in planning*, of these specifications.
- 6.15.3.1.9 When temporary devices are being installed for the first time and every time they are adjusted or moved, they shall be inspected by the **Contractor's** engineer/designer, who shall issue an inspection report certifying that the devices comply with the approved drawings.
- 6.15.3.1.10 Copies of the *Contractor's Drawings*, including the drawings for platforms, scaffolding, and other access devices, and of the inspection certificates shall be kept at the site at all times during the execution of the work.
- 6.15.3.1.11 The **Contractor** shall install signs on its platforms indicating maximum permissible loads. To facilitate workers' interpretation of maximum permissible loads, signs shall indicate the maximum number of persons, the maximum depth of abrasive or demolition debris and the maximum weight of construction material and equipment allowed on the platforms at all times. For the entire duration of the work, the **Contractor** shall ensure that equipment and debris are disposed of or removed so that the weight of residues, equipment and workers does not exceed the live load that was calculated and posted on the signs.
- 6.15.3.1.12 The suspension of temporary devices from bridge chords or other structures shall be effected in a way that complies with the structural integrity of these chords or structures. The drawings shall indicate the loads placed on the various chords or structures. The **Contractor** shall ensure that the chords or structures can bear all of the additional loads that are placed upon them. If this is not the case, the **Contractor** shall modify these works accordingly at no cost to the **Owner**. The **Contractor's** engineer/designer shall submit the design notes for the temporary devices to the Engineer.

- 6.15.3.1.13 The temporary devices shall be designed and constructed in such a way as to prevent all objects, residues or debris from falling and shall be equipped with enclosures, tarpaulins, fabric or screens to protect property and people during the work, according to requirements. When designing temporary devices the **Contractor's** engineer/designer shall take the wind load into consideration and quantify it in the drawings.
- 6.15.3.1.14 Temporary devices that are subjected to winter conditions shall be cleared of snow and ice by the **Contractor**. The **Contractor** shall take appropriate measures to avoid an accumulation of unforeseen loads.
- 6.15.3.1.15 Temporary devices erected above a street, a lane of traffic, a parking lot or a building shall comply with free vertical clearance provisions of the standards of the authorities responsible for these devices.
- 6.15.3.1.16 The **Contractor's** electrical systems shall meet the requirements of article 5.16.8 *Electricity and Temporary Lighting*.
- 6.15.3.1.17 The choice of components of platforms, enclosures, walkways, scaffolding, formwork, bracing, supports or other temporary works shall be such that fire hazards are eliminated at source. In addition, these works shall be equipped with devices that make it possible to fight fires immediately and effectively.
- 6.15.3.1.18 The design of enclosures, scaffolding, walkways and other access devices shall be in compliance with the *Safety Code for the construction industry (R.Q. S-2.1, r.6.)*
- 6.15.3.1.18.1 Minimal live loads to be used for the purposes of designing platforms, their components and fastening devices are 2.4 kPa.
- 6.15.3.1.19 The **Contractor** shall assume all of the risks to which his enclosures, scaffolding, walkways, access devices and equipment left on the site during and outside work periods are exposed. The **Contractor** shall, at no additional cost and to the satisfaction of the Engineer, take all necessary steps to ensure that enclosures, scaffolding and walkways are inaccessible to the public.
- 6.15.3.1.20 The **Contractor** shall submit to the Engineer for review a detailed procedure signed and sealed by the **Contractor's** engineer/designer who designed the enclosures, scaffolding and walkways for lifting, moving and disassembling the enclosures, scaffolding and walkways. No lifting, moving or disassembly of enclosures, scaffolding or walkways shall be conducted until this procedure has been reviewed by the Engineer.
- 6.15.3.1.21 For every enclosure, scaffold, platform, walkway and other access device, the **Contractor** shall provide the Engineer with a document signed by the **Contractor's** engineer/designer certifying that the temporary devices were erected in compliance with the *Contractor's Drawings* and that workers and users can use them safely. No work shall be commenced until the mandatory report referred to in paragraph 6.15.3.1.9 has been issued.

- 6.15.3.1.22 The **Contractor** shall give the Engineer twenty-four (24) hours notice whenever the **Contractor's** engineer/designer who designed the platforms, enclosures, scaffolding, walkways and other access devices is due to visit, as the Engineer shall accompany the **Contractor's** engineer/designer each time the latter visits the site to verify and certify that the devices are in compliance with paragraph 6.15.3.1.9.
- 6.15.3.1.23 Before work of any nature requiring the use of platforms begins, the **Contractor** shall prepare and submit to the Engineer a diagram identifying provisions respecting the distribution of live loads on work platforms. This diagram shall include the location and a description of the equipment, materials and workers to be distributed on the platforms. The load distribution diagram shall bear the seal and signature of the **Contractor's** engineer/designer who designed the platforms. The diagram shall be displayed at all times on the work platform and accessible to all.
- 6.15.3.1.24 Access to the staging shall be available at all times by a ladder or staircase which can be accessed by the ground or by the water, whichever the case may be. The **Contractor** must insure himself that the ladders or staircases are only accessible to authorised personnel. The **Contractor** shall from the beginning of the work, put all into place to conceive, get the drawings reviewed and install the staging, work ladders or stairs as quickly as possible in order for the damage survey to be executed on the damaged elements concerned.
- 6.15.3.1.25 The **Contractor** shall leave in place the staging, scaffolding and other access for a minimum period of twenty-four (24) hours after each work phase in order to permit the Engineer's Representative to verify the quality of the work. This period can be increased if weather conditions do not permit this verification to be completed.
- 6.15.3.1.26 Failure by the **Contractor** to meet the requirements of paragraph 6.15.3.1.23 shall result in the application of article 5.35.11 *Damages for failure to comply with requirements related to temporary devices*.
- 6.15.3.2 SPECIFIC MEASURES FOR ENCLOSURES
- 6.15.3.2.1 When required in Section 4 *Special Technical Conditions* or to ensure the protection of workers, the public or users, or as required under federal, provincial or other regulations, standards, codes or acts, enclosures shall be designed and constructed so as to provide protection on all sides of the work areas. Enclosures shall prevent dust and other materials used or produced during the preparation of surfaces, cleaning and painting from escaping for the entire duration of the work.
- 6.15.3.2.2 The enclosures shall be designed to resist wind pressure as specified in the *National Building Code – Canada 2005*.

- 6.15.3.2.3 The walls of the enclosures along the full length of the traffic lanes (for motor vehicles, pedestrians and cyclists) shall be made of rigid materials (e.g., plywood) so as to resist wind loads as well as suction created by passing trucks. The rigid materials shall be fastened appropriately.
- 6.15.3.2.4 The materials collected or accumulated within the enclosures shall be contained so as to prevent their escape. The collected materials shall be removed from the site in accordance with subsection 6.13, *Environmental Protection*.
- 6.15.3.2.5 The **Contractor** shall ensure that materials collected or accumulated are disposed of in such a way that the weight of materials, equipment and workers on the scaffolding, walkways and other access devices does not exceed the live load specified in the drawings of the said scaffolding, walkways and other access devices.
- 6.15.3.2.6 Before moving or removing enclosures, scaffolding, and walkways, the **Contractor** shall perform whatever cleanup, removal and collection of materials is necessary to prevent the said materials from escaping or remaining suspended in the air.
- 6.15.3.2.7 The **Contractor** shall provide a level of illumination inside the enclosures of at least 538 lux (50 foot-candles) during the cleaning, painting and work inspections by the Engineer, the painting inspectors or any other representative of the Engineer. By way of indication, this level of illumination is that which would normally be found in offices.
- 6.15.3.2.8 The **Contractor's** system of enclosures shall not encroach on the bridge and access ramp traffic lanes when the latter are open to traffic.
- 6.15.3.2.9 The **Contractor's** enclosure system shall not obstruct aerial traffic signals and surveillance cameras.
- 6.15.3.2.10 The **Contractor** shall ensure that there is no water accumulation on the fabric making up the enclosure roofing.
- 6.15.3.2.11 The **Contractor** shall take all necessary precautions to prevent objects of whatever nature from falling from the works. The **Contractor** shall provide and install on platform joints engineering fabric or any other means approved by the Engineer for containing dust, abrasives, paint and any other residues. The equipment and materials shall be rendered inaccessible to the public.
- 6.15.3.3 NIGHT WORK
- 6.15.3.3.1 The **Contractor** shall provide, install and maintain lighting, a surveillance system, barriers and all other equipment needed for carrying out work at night. The temporary devices shall include an illumination system that allows workers to work without any supplementary lighting.

6.15.3.4 TEMPORARY PLATES AND RAMPS

6.15.3.4.1 The **Contractor** shall install steel plates or some similar device to cover over temporary gaps in traffic lanes, cycle paths and sidewalks. These steel plates shall have chamfered edges with a slope of at least 1:10 if the plates are more than 8 mm thick and result in dislevelment of the traffic lanes, cycle paths and sidewalks.

6.15.3.4.2 The design of the steel plates or any similar devices shall be such that they can resist the corresponding imposed load and ensure a dynamic loading factor of at least 0.50 in the traffic lanes. The steel plates shall be solidly fastened so as to prevent any lateral, longitudinal or vertical movement. The plates' design and the way in which they are fastened shall make allowances for braking and uplift loads. The surfaces of all plates exposed to traffic (vehicles, cyclists and pedestrians) shall have a skid-resistant overlay.

6.15.3.4.3 SIDEWALKS AND CYCLE PATHS

6.15.3.4.3.1 While work is in progress, the **Contractor** shall install temporary ramps when the level of the sidewalk or cycle path changes abruptly by over 19 mm. The slope of the temporary ramps shall be at least 1:10. Ramps shall be made of wood, concrete or asphalt concrete, according to requirements. Details of the type of temporary ramp to be installed shall be submitted to the Engineer for review and comment.

6.15.3.4.3.2 The **Contractor** shall use yellow reflective strips to mark or identify abrupt changes of level on sidewalks and cycle paths.

6.15.3.4.4 TRAFFIC LANES

6.15.3.4.4.1 While the work is in progress, the **Contractor** shall install temporary ramps when the level of the traffic lanes changes abruptly by over 19 mm. Temporary ramps shall be made of asphalt concrete except where the drawings prescribe otherwise and subject to those applicable provisions of subsection 6.12 *Health and Safety*. The following table shows the minimum allowable slopes in accordance with posted speed limits and the extent of the change in level.

Speed Limit	Extent of the Change in Level	Minimal Slope of the Temporary Ramp
Less or Equal to 50 km/h	Between 19 mm and 63 mm	1:40
	Over 63 mm	1:80
Over 50 km/h	Over 19 mm	1:80

6.15.3.4.4.2 Details of the type of temporary ramp to be installed shall be submitted to the Engineer for review and comment. To ensure the comfort and safety of users, the **Owner** reserves the right to ask the **Contractor** to install temporary ramps with slopes that are different from those specified in the preceding table.

END OF SUBSECTION