

**Part 1 General**

**1.1 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CAN/CSA-A23.3-04, Design of Concrete Structures for Buildings.
  - .3 CAN/CSA-086-01 Consolidation (R2006), Engineering Design in Wood along with 086S1-05 Supplement No. 1 to CAN/CSA-086-01, Engineering Design in Wood.
  - .4 CAN/CSA 0121-08, Douglas Fir Plywood.
  - .5 CAN/CSA-0122-06, Structural Glued-Laminated Timber.
  - .6 CAN/CSA-S269.1-1975 (R2003), Falsework for Construction Purposes.
  - .7 CAN/CSA-S269.2-M87 (R2003), Access Scaffolding for Construction Purposes.
  - .8 CAN/CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel I Structural Quality Steels.
  - .9 CAN/CSA-8157-05, Strength Design in Aluminum.
  - .10 CAN/CSA-S6-14, Canadian Highway Bridge Design Code.
  - .11 CAN/CSA-S6-14, Commentary on CAN/CSA-S6-14 Canadian Highway Bridge Design Code.
  - .12 CAN/CSA-S6S1-10, Supplement #1.
  - .13 CAN/CSA-S6S2-11, Supplement #2.
  - .14 CAN/CSA-Z271-F10, Safety Code for Suspending Elevating Platforms.
  - .15 CAN/CSA-Z797-09, Code of Practice for Access Scaffolds.

**1.2 DEFINITIONS**

- .1 Access to Work: any method used for access to carry out the work such as rigid framed scaffolding, mobile access buckets, elevated platforms, cranes, ladders, work/suspended platforms, etc.

**1.3 DESIGN REQUIREMENTS**

- .1 Access to Work components must be designed in accordance with CAN/CSA-S6-14.
- .2 In addition to the above, the following load limits shall apply:
  - .1 Slab-on-girder sections at South and North Trestles: 400 kg per support point with a maximum of two support points loaded per girder per span.
  - .2 Truss Structures:
    - i. 400 kg per panel point with a maximum of two panel points loaded on a truss, or

- ii. Maximum factored load of 156 kN per truss panel point for the execution of the west truss L11-L12 bottom chords strengthening, with the following conditions:
  - 1. Loads applied only at Truss Panel Points L11 and L12.
  - 2. Loads applied only upon full closure of the east lane to vehicular traffic and removal of all live load/construction loads from the east lane deck.
  - 3. No additional construction loads elsewhere on the truss structures allowed.
  - 4. Execution of west truss L11-L12 bottom chords strengthening only upon full closure of both traffic lanes, and no live load/construction load on the east deck or center deck.
- iii. Maximum factored load of 268 kN per truss panel point after completion of the west truss L11-L12 bottom chords strengthening, with the following conditions:
  - 1. Loads applied only at Truss Panel Points L4 to L15, and L21 to L33.
  - 2. Loads applied only upon full closure of the east lane to vehicular traffic and removal of all live load/construction loads from the east lane deck.
  - 3. No additional construction loads elsewhere on the truss structures allowed.
- .3 Field welding to existing structural steel components will not be permitted.
- .4 Drilling of holes or modifications to new or existing structural steel components not shown on the contract drawings must not be permitted without the approval of the Departmental Representative.
- .5 Where manufactured/proprietary systems are used, the design must be in conformance with the manufacturer's recommendations.
- .6 Access to the installations and from the Access to Work facilities must conform to all relevant occupational and health and safety regulations.
- .7 The platforms must be designed to support all loads coming from the confinement enclosures required for, structural repairs, preparing and painting the surfaces of the steel structure, and all other work required.
- .8 Clearly identify storage areas on the platforms and other temporary access (on drawings and on site). The maximal allowable storage loading should be clearly identified. Platforms and temporary access should be designed according to those loads. A clear and bilingual posting must be installed at the designated areas. No accumulation of new or used material will be allowed on the bridge nor on the temporary platform, but in the designated areas of the platform designed and identified to carry such loads.

#### **1.4 SHOP DRAWINGS**

- .1 Shop drawings must be submitted in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Submit shop drawings for all temporary access, work platforms, and scaffolding systems. Shop drawings for a given area must be submitted to the Departmental Representative at least two (2) weeks prior to commencement of work in that area, for information purposes only. Each submission must be sealed and signed by a Design Engineer licensed to practice in the provinces of Ontario and Quebec.
- .3 Shop drawings must show the location and magnitude of all applied loads.
- .4 Where the applied loads exceed the limits specified in 1.3.2 above, submit a structural evaluation including all detailed calculations confirming that the bridge structure will adequately support the additional loads imposed by the proposed Access to Work facilities, including detailed calculations and notes. The documents must bear the seals and signatures of two (2) Professional engineers, the Evaluation Engineer and the Checking Engineer, licensed in Provinces Ontario and Quebec.
- .5 Retain documentation of such evaluation for a period of six (6) years after the Departmental Representative has issued a Certificate of Completion.
- .6 Access to Work shop drawings for temporary works must include at least the following information:
  - .1 The longitudinal, lateral and vertical loads coming from the construction, live, snow, wind and impact loads used in the design. The platform loads must include the wind loads, the live loads and the loads caused by the accumulation of deposits from the confinement enclosures;
  - .2 The materials and dimensions, including the grade and actual size, of all materials and structural members;
  - .3 The posts, connections, columns, suspension lines, braces and welds must be sufficiently detailed for the analysis;
  - .4 The complete details of the frame shoring;
  - .5 The type, weight and dimensions of the equipment, mobile or stationary, that will be supported by the platforms;
  - .6 The technical sheets for all the equipment and/or systems manufactured;
  - .7 The details and methods for maintaining the lateral and rotational stability of the members of the existing structure;
  - .8 Confirmations of all dimensions measured at the site;
  - .9 Interferences with all other works must be shown on the shop drawings (work platform vs. confinement enclosure vs. temporary shoring, etc.).

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Scaffolding, work platforms and other access materials must be new, or used materials in good condition.
- .2 Scaffolding to be in accordance with CAN/CSA-S269.2-M87 (R2003), CAN/CSA-Z271 and CSA-Z797.

- .3 Materials must be in accordance with relevant documents detailed in 1.1 References.

### **Part 3 Execution**

#### **3.1 MEANS OF ACCESS TO CARRY OUT THE WORK**

- .1 Provide and maintain all scaffolding, ramps, ladders, swing staging, platforms, temporary stairs, access lifting equipment, etc. as necessary to carry out the Work. All means of access to be in accordance with the Occupational Health and Safety Act and the Act Respecting Occupational Health and Safety. Field measure to ensure proper fit of all works.
- .2 Scaffolding installed on ground must be erected on mud sills. Mud sills must be of sufficient size to ensure no damage to existing features.
- .3 Where the scaffolding is suspended from the existing bridge, the methods of suspension must be such as to permit the execution of the work and also not adversely impact the integrity of the structure or to the existing components of the structure.
- .4 Where access is provided for work over, in or adjacent to the waterway, ensure environmental protection is provided in accordance with Section 01 35 43 - Environmental Procedures.
- .5 Be responsible for removal of all anchors. Contractor is responsible to ensure all holes are filled as scaffolding is dismantled.
- .6 There shall be no damage to the existing coating on steel components as a result of the Contractor's operations. Any coating damage resulting from the erection, use, or dismantling of scaffolding or work platforms must be repaired in accordance with the contract documents at the Contractor's expense.
- .7 Prior to commencement of work on any Access to Work facilities the Design Engineer for the access facilities must complete a site inspection and issue a Certificate of Conformance, as specified elsewhere in the Contract Documents, to be submitted to the Departmental Representative. The Certificate must verify that the installation has been constructed in conformance with the shop drawings and is safe for usage. A given installation will not be considered to be fully erected until a Certificate of Conformance has been issued.

#### **3.2 TEMPORARY SUPPORTS**

- .1 The structure's temporary supports must be designed to minimally support loads that are equivalent to the capacity of the members that it supports.
- .2 In areas where the support is suspended to the bridge's existing structure, the suspension methods must allow for the adequate execution of the work and they must not cause any negative impacts to the integrity of the structure or to the existing components of the structure. All suspension methods must be approved by the Departmental Representative.
- .3 In areas where the supports are installed above or near the waterway, ensure that environmental protections are provided in accordance with Section 01 35 43 - Environmental Procedures.
- .4 Before beginning the work, as part of Quality Control and Provincial Health and Safety Regulations, one of the engineers who designed the supports must conduct an inspection

of the temporary works and issue a certificate of Conformance to the Departmental Representative. The Certificate must verify that the installation has been constructed in conformance with the shop drawings. A given installation will not be considered to be fully erected until a Certificate of Conformance has been issued.

### **3.3 CONFINEMENT ENCLOSURES**

- .1 Provide and maintain all confinement enclosures needed to complete the work. The confinement enclosures must confine the dust inside and allow for the collection of all residues.
- .2 The enclosures must be sealed. The tarps used must be adequately reinforced so as to prevent ripping or movement when subjected to construction loads, wind or other environmental factors.
- .3 The Contractor must prevent the leaking of dust and the loss of residues from the floor or other components of the confinement enclosures when moved or dismantled. The floor, walls and joints must be cleaned using a vacuum cleaner before being moved or dismantled.
- .4 Additional lighting must be available and used if necessary to improve visibility inside the enclosures. The minimum lighting level must be 50 lx in the zones where the work is being done.
- .5 The drawings of the confinement enclosures must include the following elements:
  - .1 All design and construction details;
  - .2 Details regarding the device to be used to recover residues from preparation work and surface painting;
  - .3 Wind loads used for designing the enclosures;
  - .4 The loads from the weight of the residues that can accumulate inside the enclosure;
  - .5 Construction loads (presence of workers, equipment, etc.);
  - .6 The loads transmitted to the support points of the enclosures.
- .6 In areas where the works will be installed above or near the waterway, ensure that the environmental protections are compliant with Section 01 35 43 – Environmental Procedures.
- .7 Before beginning the work, as part of Quality Control and Provincial Health and Safety Regulations, one of the engineers who designed the enclosure must conduct an inspection of the temporary works and issue a certificate of Conformance to the Departmental Representative. The Certificate must verify that the installation has been constructed in conformance with the shop drawings. A given installation will not be considered to be fully erected until a Certificate of Conformance has been issued.

**END OF SECTION**