

TENDER DOCUMENTS

SUBSECTION 6.62 BRIDGE BEARINGS

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SUBSECTION 6.62 BRIDGE BEARINGS

6.62.1 GENERAL

- 6.62.1.1 This subsection sets out the requirements related to the installation and replacement of bridge bearings.
- 6.62.1.2 Any specific requirements related to the installation and replacement of bridge bearings prescribed in this Contract are set out in Section 4 *Special Technical Conditions* and on the drawings.
- 6.62.1.3 The requirements related to reinforcing steel are set out in subsection 6.31 *Reinforcing Steel for Concrete*.
- 6.62.1.4 The requirements related to formwork are set out in subsection 6.32 *Formwork*.
- 6.62.1.5 The requirements related to cast-in-place concrete are set out in subsection 6.33 *Cast-in-Place Concrete*.
- 6.62.1.6 The requirements related to steel work are set out in subsection 6.41 *Steel Work*.
- 6.62.1.7 The requirements related to jacking are set out in subsection 6.61 *Bridge Jacking*.

6.62.2 REFERENCE STANDARDS

- 6.62.2.1 The **Contractor** shall perform all work related to the replacement of bridge bearings in accordance with the requirements of the following standards and documents to which the provisions of the Contract are added:
- 6.62.2.1.1 (CSA) Canadian Standards Association
- CAN/CSA-A23.1-04/A23.2-04 *Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete*;
 - CAN/CSA A23.3-04 *Design of Concrete Structures*;
 - CAN/CSA G40.20-04/G40.21-04 *General Requirements for Rolled or Welded Structural Steel/Structural Steel*;
 - CAN/CSA-G164-M92 (R2003) *Hot Dip Galvanizing Of Irregularly Shaped Articles*;
 - CAN/CSA S6-06 *Canadian Highway Bridge Design Code*.
- 6.62.2.1.2 (MTQ) Ministère des Transports du Québec
- MTQ – *Cahier des charges et devis généraux (CCDG)*.

6.62.3 MATERIALS

6.62.3.1 GENERAL

- 6.62.3.1.1 The **Contractor** is responsible for choosing the manufacturers of the products used and for the performance of those products once they are in place.
- 6.62.3.1.2 The Engineer may reject any material that did not meet the technical requirements on similar projects in the past.
- 6.62.3.1.3 The design, fabrication and installation of bridge bearings shall conform to standard CAN/CSA S6.
- 6.62.3.1.4 Bridge bearings shall be designed and sized so as to meet the load, movement and space requirements shown on the drawings.
- 6.62.3.1.5 The design notes and shop drawings shall be signed and sealed by an engineer who is a member of the Ordre des ingénieurs du Québec and has at least ten (10) years of relevant experience.

6.62.3.2 BRIDGE BEARINGS

6.62.3.2.1 Laminated elastomer bridge bearings

- 6.62.3.2.1.1 Laminated elastomer bridge bearings shall be pressure moulded in a single block and heated in blocks with a smooth finish.
- 6.62.3.2.1.2 Laminated bridge bearings shall be made of natural rubber/steel and laminated and have a hardness of 55 ± 5 .
- 6.62.3.2.1.3 The elastomer material shall be a natural rubber-based compound adapted to the prevailing weather conditions at the work site.
- 6.62.3.2.1.4 Steel layers shall meet the following requirements:
 - 6.62.3.2.1.4.1 the thickness of the elastomer layers and steel layers shall be uniform;
 - 6.62.3.2.1.4.2 inside steel layers shall have no sharp edges;
 - 6.62.3.2.1.4.3 steel surfaces shall be fully bonded to the elastomer on all surfaces during moulding.
- 6.62.3.2.1.5 The elastomer covering on the sides shall be at least 5 mm thick. The thickness of the covering on outside layers at the top and bottom shall not be more than 70% of the thickness of a single inside layer of elastomer.

- 6.62.3.2.1.6 Unless otherwise indicated in the *Special Technical Conditions*, steel layers shall be made of rolled mild sheet steel with a minimum elasticity of 230 MPa conforming to standard CSA G40.21.
- 6.62.3.2.1.7 The following are some of the bridge bearings that meet these requirements:
- Goodco Limited bridge bearing, Series EL;
 - Wercho bridge bearing, manufactured by Wercholz Canada Inc.;
 - elastomer bridge bearing, model L-ELN-2100, manufactured by Produits technologiques LCL-Ponts Inc.
- 6.62.3.2.2 Replaceable confined elastomer bridge bearings
- 6.62.3.2.2.1 The elastomer material shall be a natural rubber-based compound adapted to the prevailing weather conditions at the work site.
- 6.62.3.2.2.2 The bridge bearing shall have a neoprene protective skirt 3 mm thick attached to the top plate in order to minimize the infiltration of contaminants.
- 6.62.3.2.2.3 The steel shall be 300W or 350W grade conforming to standard CAN/CSA G40.21.
- 6.62.3.2.2.4 Exposed steel shall be galvanized in conformity to standard CAN/CSA-G164.
- 6.62.3.2.2.5 Bridge bearings shall be equipped with lateral adjustment screws or an equivalent device allowing the alignment of the bearing to be precisely adjusted to permit rectilinear slip between the side bumper bars. Bridge bearings shall be designed so as to allow the bearing plates to be firmly secured in place after final adjustment of the alignment.
- 6.62.3.2.2.6 Bridge bearings shall be equipped with a longitudinal adjustment device allowing the longitudinal position of the bridge bearing to be accurately adjusted based on the temperature at the time of installation and to ensure optimum positioning. Bridge bearings shall be designed so as to allow the bearing plates to be firmly secured in place after final longitudinal adjustment.
- 6.62.3.2.2.7 The following are some of the bridge bearings that meet these requirements:
- model PMG bridge bearing from Goodco Limited;
 - model PZGI bridge bearing from Z-Tech;
 - model L-PG bridge bearing from Produits Technologiques LCL – Ponts Inc.

6.62.4 INSPECTION AND STORAGE

- 6.62.4.1 Bridge bearings shall be clearly identified by the manufacturer. The **Contractor** shall provide the Engineer with the waybills on request.
- 6.62.4.2 Bridge bearings shall be protected against impact and contaminants during all stages of handling, storage and installation.
- 6.62.4.3 Damaged bridge bearings or bridge bearings deemed by the Engineer to be damaged will be rejected.

6.62.5 EXECUTION

- 6.62.5.1 At least fourteen (14) days prior to the start of work, the **Contractor** shall submit to the Engineer for review and comments the technical data sheets and shop drawings for the bridge bearings to be used. The products shall be approved by the Engineer before they are delivered to the work site.
- 6.62.5.2 REMOVAL OF EXISTING BRIDGE BEARINGS
 - 6.62.5.2.1 The **Contractor** shall remove existing bridge bearings in accordance with the requirements related to the specific details of any temporary supports shown on the drawings and the requirements of subsection 6.61 *Bridge Jacking*.
 - 6.62.5.2.2 Existing bridge bearings shall not be removed until the loads have been completely transferred to the temporary support system and the existing bridge bearing is no longer carrying a load.
 - 6.62.5.2.3 Existing bridge bearings shall not be removed until the **Contractor's** engineer/designer has given authorization to proceed.
 - 6.62.5.2.4 Unless otherwise indicated in the *Special Technical Conditions*, the existing bridge bearings after removal become the property of the **Contractor**, who shall dispose of them in an appropriate site at no cost to the **Owner**.
- 6.62.5.3 PLACEMENT OF NEW BRIDGE BEARINGS
 - 6.62.5.3.1 Bridge bearings shall be placed in accordance with these drawings and specifications and as recommended by the manufacturer.
 - 6.62.5.3.2 At the time of placement, the bearing surfaces and the bridge bearings themselves shall be clean and free of any non-adhering material or lubricant.
 - 6.62.5.3.3 The alignment of the bridge bearings shall be such that the axis of the bridge bearing is perfectly parallel to the direction of movement.

- 6.62.5.3.4 The position of the bridge bearings shall be such that the two axes of the bridge bearing are placed within ± 3 mm of their exact theoretical positions under the structural components to be supported.
- 6.62.5.3.5 Unless otherwise indicated in the *Special Technical Conditions*, the **Contractor** shall establish its work schedule so as to ensure that installation takes place when the air temperature forecast by Environment Canada is between +15°C and -10°C.

END OF SUBSECTION