Tenders for this work will be received by the Town of Ste. Anne, at:

Unit B, 30 Dawson Road
Ste. Anne, Manitoba
R5H 1B5

Until 2:00 PM, CDT on June 16, 2017

TENDER NO. 2017-01616

THE SUPPLY, FABRICATION, AND DELIVERY OF A STEEL BOWSTRING TRUSS PEDESTRIAN BRIDGE AT THE EMILE CHAMPAGNE BRIDGE OVER SEINE RIVER IN THE TOWN OF STE. ANNE, PROVINCE OF MANITOBA

Operations Manager – Marc Darker
Telephone No. (204) 422-5293

COPY NO. 001
TO THE OPERATIONS MANAGER OF THE TOWN OF STE. ANNE:

I/We, the hereinafter signed, hereby tender and agree to execute and construct all the work of every description required in the construction and final completion of the following work:

The Supply, Fabrication, and Delivery of a Steel Bowstring Truss Pedestrian Bridge at the Emile Champagne Bridge over Seine River in the Town of Ste. Anne, Province of Manitoba.

in accordance with the applicable specifications and with the plans on file in the Town of Ste. Anne Office.
WORK SCHEDULE

TENDER NO. 2017-01616  TENDER FOR: Supply, Fabrication and Delivery of a Steel Bowstring Truss Pedestrian Bridge at the Emile Champagne Bridge over Seine River in the Town of Ste. Anne, Province of Manitoba.

CONTRACTOR: ________________________________

Date on which Contractor’s Supplied Bridge will be delivered to Site: ________________

Bidders shall indicate the percentage of work which they anticipate will be accomplished on each item of Work by the end of each Time Period. The percentages on each Item shall be carried forward until the items show 100% complete.

<table>
<thead>
<tr>
<th>Bid Item No.</th>
<th>Items of Work</th>
<th>Time Period - Months - 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>June</td>
</tr>
<tr>
<td>1</td>
<td>Supply and Fabrication of Steel Truss Bridge</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Delivery of Steel Truss Bridge</td>
<td></td>
</tr>
</tbody>
</table>

* Final Completion date August 31, 2017

For the interpretation of this Contract, the completion date of the Town governs and the Contractor’s anticipated completion date is strictly for the Town’s information to give some idea of the Contractor’s work schedule.
# SCHEDULE OF PRICES

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description of Work</th>
<th>Estimated Quantities</th>
<th>Unit</th>
<th>Unit Price $</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply and Fabrication of Steel Truss Bridge</td>
<td>1</td>
<td>Lump Sum</td>
<td>Lump Sum</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Delivery of Steel Truss Bridge</td>
<td>1</td>
<td>Lump Sum</td>
<td>Lump Sum</td>
<td></td>
</tr>
</tbody>
</table>

Total Price: $________________
The following documents and specifications form part and parcel of this tender. Documents which are not contained in the Bridge Specification book are attached hereto:

<table>
<thead>
<tr>
<th>Name or Title</th>
<th>Number</th>
<th>Date</th>
<th>No. of Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Provisions</td>
<td>--</td>
<td>--</td>
<td>6</td>
</tr>
<tr>
<td>Bidding Procedures</td>
<td>90</td>
<td>February 2017</td>
<td>14</td>
</tr>
<tr>
<td>Non Bonded General Conditions</td>
<td>110 (I)</td>
<td>February 2017</td>
<td>19</td>
</tr>
<tr>
<td>Provisions Relating to:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Liquidated Damages</td>
<td>130 (I)</td>
<td>February 2017</td>
<td>9</td>
</tr>
<tr>
<td>Specifications for:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Supply, Fabrication and Delivery of Structural Steel</td>
<td>1060 (I)</td>
<td>March 2010</td>
<td>24</td>
</tr>
<tr>
<td>Location and Bridge Plan</td>
<td>161-01616-00</td>
<td>October 2016</td>
<td>1</td>
</tr>
</tbody>
</table>
Bidding Requirements

General Specification 90 (I) For Bidding Procedures, details Bidding Requirements and Conditions. Submission of this tender shall be prima facie evidence that the undersigned has examined General Specification 90 (I) For Bidding Procedures and is familiar with the requirements contained therein.

Working Days and Liquidated Damages

Work on this project shall be completed free of liquidated damages on or before August 31, 2017.

Liquidated damages, after this specified time limit, will be charged at the rate of $500.00 per day.

Agreement

The undersigned agrees, should this tender be accepted, to enter into a written agreement with the Town of Ste. Anne, Province of Manitoba for the faithful performance of all work necessary or incidental to the completion of the herein described project, in accordance with the specifications and plans provided.

Amendment Acknowledgment

The Contractor acknowledges that the following tender amendments have been received and they form a part of this Tender.

<table>
<thead>
<tr>
<th>Amendment</th>
<th>Date of Amendment</th>
</tr>
</thead>
</table>

Dated at __________ this _______ day of __________, 2017

________________________________________
Name of Contractor

Per: ____________________________________
Contractor’s Signature (Sealed)

________________________________________
Address

Telephone Numbers

Bus: ___________ Res: ___________
SPECIAL PROVISIONS

1 Scope of Work

1.1 The work to be done under this Contract shall consist of the supply, fabrication, and delivery of a 24.4 m long x 2.4 m wide (clear width) steel bowstring truss bridge, complete with bearing assemblies at the Emile Champagne Bridge over Seine River located in the Town of Ste. Anne, Province of Manitoba.

2 Site Access and Delivery Location

2.1 The Contractor shall coordinate site access and delivery location with town of Ste. Anne Operations Manager, Mr. Marc Darker at (204) 422-5293.

3 Cooperation With Others

3.1 Other utility companies, and/or crews may be working adjacent to the bridge during the course of delivery. The Contractor shall cooperate with others with respect to the scheduling and conducting of their respective operations.

4 Completion Date, Delivery and Liquidated Damages

4.1 In accordance with Specification 130 (I), For Liquidated Damages, the following will apply:

4.1.1 The Contractor shall have the steel truss pedestrian bridge available for delivery by August 31, 2017;

4.1.2 Daily liquidated damages will be $500.00.

4.2 The Contractor shall deliver the steel truss pedestrian bridge to the Emile Champagne bridge site in the Town of Ste. Anne within fourteen (14) days of receiving notice from the Town of Ste. Anne.

4.2.1 In the event the Contractor fails to deliver the steel truss pedestrian bridge on the date the Town requires, the Contractor may be required to pay liquidated damages to the Town in the sum of $500.00 per day, for each calendar day of delay, up to a maximum of 30 days, to compensate for costs associated with the delay in construction.

4.2.2 For the purposes of Specification 130 (I), the Work in this Contract will not be considered road construction work.

5 Professional Liability

5.1 The Registered Professional Engineer(s) responsible for design and construction of all temporary shoring, and hoarding, shall submit proof of insurance coverage for professional liability except where the engineer is an employee of the Contractor, in
which case the Contractor shall submit proof that work by the Registered Professional Engineer is included in the Contractor’s insurance coverage. Drawings for temporary works shall be sealed by Registered Professional Engineer, certified in the Province of Manitoba.

6 Safety

6.1 The Contractor is reminded that his operations shall be conducted in accordance with the Manitoba Workplace Safety and Health Act. If it is determined at any stage of the Contract work that the Contractor is not conducting his operations in accordance with the “Manitoba Workplace Safety and Health Act”, the work will be stopped immediately until a safety officer can determine what measures need to be brought into effect for compliance.

7 Design

7.1 The steel truss pedestrian bridge shall be a “Bowstring” style truss bridge with a 3% (730 mm) camber.

7.2 Total length of the bridge deck shall be 24.4 meters (80 ft).

7.3 Minimum clear width shall be 2.44 meters (8 ft).

7.4 A steel pedestrian guardrail shall be provided for both sides of the deck.

7.5 The bridge deck surface shall be pressure treated timber planks.

7.6 The steel bridge shall be designed in accordance with the requirements of CAN/CSA-S6-14 “Canadian Highway Bridge Design Code” including Pedestrian Loads and Maintenance Vehicle Loads.

7.7 Structural steel shall conform to the requirements of CAN/CSA-G40.21-M and the requirements of Specification 1060 (I), Section 4.0.

7.8 All steel shall be Type A or Type AT atmospheric corrosion-resistant steel.

7.9 Detailed professionally drafted plans of the pedestrian bridge including bearing assemblies, stamped by a Professional Engineer registered in the Province of Manitoba, shall be submitted to the Town for review at least one week prior to starting fabrication of the bridge.
SPECIAL PROVISIONS

8 Submittals

8.1 The Contractor shall submit the following to the Engineer for approval prior to commencing fabrication in accordance with Section 3.0 of Specification 1060 (I) For Supply, Fabrication and Delivery of Structural Steel.

8.2 Design Calculations and Shop Drawings

8.2.1 All design calculations and Shop Drawings shall be stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba.

8.2.2 In additional to Section 3.1 of Specification 1060 (I), two sets of fabrication drawings shall be submitted to the Town for review. One set of drawings containing suggestions for revisions shall be returned to the Contractor. Review of the drawings does not relieve the Contractor of his responsibility for errors, omissions, and accurate fabrication according to the drawings.

8.2.3 In addition to Section 3.1 of Specification 1060 (I), the Contractor shall provide the Town with three (3) copies of the final shop fabrication drawings.

8.3 An Erection Diagram

8.3.1 All design calculations and Shop Drawings shall be stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba.

8.3.2 In addition to Section 3.2 of Specification 1060 (I), the Contractor shall provide the Town with three (3) copies of the final Erection Diagram drawings.

8.4 Proposed welding procedures conforming to AWS D1.5 or CAN/CSA W59 and CAN/CSA W47.1 to be used in fabricating the various components.

8.4.1 In addition to Specification 1060 (I), the latest issued letter of CWB validation shall be submitted for approval to the Engineer within seven days of the tender closing date.

8.4.2 In addition to Section 6.0 of Specification 1060 (I), The Contractor shall provide the Town with the quality control plan for review and approval at least one week prior to starting fabrication of the bridge. The Town shall have access to all quality control tests used in the fabrication process.
8.5 Mill test certificates of all structural steel shall be submitted to the Engineer for review prior to commencement of fabrication.

8.6 Proof of hardware chemical composition, mechanical properties, dimensions, workmanship, and head burst as required by ASTM A 325/A 325M, A 563/A 563M or F 436/F 436M. Verification of the acceptability of assemblage of zinc coated bolts shall be provided with the bolts, nuts, and washers delivered to the job site shall also be submitted to the Engineer.

8.6.1 For bolts supplied from a manufacturer outside Canada or the United States of America, the above information shall be independently verified by testing by a Canadian laboratory as outlined in clause 3.4 of Specification 1060 (I).

8.7 Loading and transporting procedures for structural steel girders, including the proposed route and all traffic control procedures shall be stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba.

8.8 Repair procedures, if required, for repair of fabricated defects or other damage to structural steel components.

9 Fabrication of Structural Steel

9.1 The bridge and railings shall be fabricated in accordance with Specification 1060 (I) for Supply, Fabrication and Delivery of Structural Steel.

9.2 The steel truss pedestrian bridge shall be fabricated at a plant certified by the Canadian Welding Bureau to the requirements of CSA Standard W47.1-09, Division 1 or 2, and shall be fabricated using procedures which provide quality consistent with the assumptions made in CAN/CSA S6-14 “Canadian Highway Bridge Design Code”.

9.3 In addition to Section 6.0 of Specification 1060 (I), the Contractor shall provide the Town with the quality control plan for review and approval at least one week prior to starting fabrication of the bridge. The Town shall have access to all quality control tests used in the fabrication process.

9.4 In addition to Specification 1060 (I), pre-approved welding procedures together with the latest issued letter of CWB validation shall be submitted for approval to the Engineer within seven days of the tender closing date.

9.5 High strength bolts installed in the Contractor’s plant shall be tightened by turn-of-nut method as outlined in Specification 1060 (I).
9.5.1 In addition to Specification 1060 (I), after installation, exposed surfaces of the bolts, nuts and washers shall be cleaned to remove all traces of oil.

9.6 All girder and other main components shall be preassembled in the shop to prepare or verify the field splices as outlined in Specification 1060 (I).

9.7 Contrary to Clause 8.1 Specification 1060 (I) For Supply and Fabrication of Structural Steel, payment will be at the contract lump sum price and will be full compensation for supply, fabrication, and delivery of steel truss bridge and all labour, equipment, tools and incidental materials necessary to complete the Work.

10 Construction Schedule

10.1 The Contractor shall submit to the Engineer, 7 days following receipt of the notice of award, a detailed construction schedule, employing the Critical Path Method, showing the proposed time of commencement and completion of each of the various operations to be performed under each item of work for this Contract, together with all necessary and appropriate information regarding sequence and correlation of work and provision of access.

11 Miscellaneous

11.1 The words “Town of Ste. Anne” shall be substituted for “Department” or “Department of Manitoba Infrastructure and Transportation” or “Manitoba Infrastructure and Transportation” or “MIT” as and where necessary for the correct reading of documents throughout this Contract.

11.2 No Interim Payments will be considered under this Contract. A single final payment will be made to the Contractor once all materials has been successfully delivered to site, and all submissions have been reviewed; as determined by the Engineer.

11.3 Contrary to General Specification 90, online Bid submissions are unavailable at this time.

11.4 In addition to Specification 130 (I), the Contractor shall provide the Engineer 48 hours’ notice prior to the commencement or re-commencement of any work or change in work patterns affecting Town staffing levels. Work performed within the 48 hour notice period or work performed outside the normal work pattern within that 48 hour period will be considered unauthorized work.

11.5 In addition to Clause 5.9 of Specification 110 (I), all equipment shall arrive on site in a clean condition and shall be maintained to be free of fluid leaks.
11.6 In addition to Clause 5.9 of Specification 110 (I), the Contractor shall wash, refuel and service equipment; and store fuel and other materials for the equipment at locations at least 100 metres from the high water mark on each side of a waterbody.

11.7 In addition to Specification 110 (I), all structural steel shall be left on site in a clean condition and shall be free of loose scale, burrs, dirt, oil and foreign material.

11.8 During tendering, inquiries pertaining to the interpretation of the Bid Package documents shall be directed to:

Brian Bolingbroke, P.Eng.
Manager, Transportation – Bridges
WSP Canada Inc.
397 Maxwell Crescent
Regina, SK S4N 5X9
Phone: (306) 518-0875   Cell: (306) 539-6151
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SECTION 1  DEFINITIONS AND INTERPRETATION

90.1.1 Definitions

This document shall be interpreted using the definitions in the General Conditions 100. All definitions employed in this document will be capitalized to indicate a reference to the corresponding definition.

90.1.2 Interpretation

This document shall be governed by and interpreted in accordance with the laws of the Province of Manitoba and the laws of Canada.

Where the Contractor consists of more than one person, the obligations of the Contractor shall be joint and several.

If any provision of this Contract is void, illegal, invalid or unenforceable; it shall be severable from the Contract and shall not invalidate or impair the remaining provisions of the Contract.

The Contractor is acknowledged to be an independent contractor and neither the Contractor, nor any officer, servant nor agent of the Contractor is deemed to be an employee of the Owner.

The Contract constitutes the entire agreement between the Owner and the Contractor. There are no other agreements of any kind other than those contained within the Contract.

SECTION 2  GENERAL TENDER INFORMATION

90.2.1 Examination of Tender and Site

It is a Bidder’s responsibility, at the Bidder’s sole cost and expense, to carefully examine the Site, all local conditions that might affect the Work or the Bid, and all of the various documents contained and referenced in the Tender before submitting a Bid. By submitting a Bid, a Bidder represents to the Owner that the Bidder has made such examination and is satisfied as to the conditions that will be encountered in performing the Work and as to the requirements described in the Tender.

A Bidder assumes all risks for conditions that exist or that may arise in the course of the Work which could have been determined through such examination and for all costs the Bidder may incur or sustain because the Bidder failed to conduct such examination before submitting a Bid.

Any information pertaining to subsurface soil, rock or groundwater conditions provided in the Tender documents has been obtained for design purposes and is valid only at the specific locations at which the information was collected. Bidders may wish to supplement this information by performing their own investigations but must first request permission to access the Site and perform the investigation from the Contract Administrator.

90.2.2 Contents of Tender Documents

The Tender sets out the Bid security submission requirements (if any), the Submission Deadline, the acceptable submission methods and the Submission Location.

The Tender also describes, in detail, the Work to be done, the Site, the time within which or by when the Work must be completed and the amount of Liquidated Damages (if any) payable for failing to meet such requirements.

The following documents form part of the Tender, whether or not they are attached to the Tender:

a)  Bid Forms

b)  Standard Construction Specifications
c) Bidding Procedures  
d) General Conditions  
e) Special Provisions  
f) Detailed Design Drawings  
g) Other documents applicable to the Work, as listed in the Tender.

The above documents which are not attached to the Tender are incorporated by reference and the most current versions available and in effect at the time of Bid Submission, may be obtained at:


90.2.3 Notice of Tender

Notices of Tender will be posted by the Owner. Such notices will indicate where Tenders may be obtained.

Where Manitoba is the Owner, notices will be posted on Manitoba’s online procurement service provider website www.MERX.com.

At the time a Bidder obtains a Tender, it will be required to provide contact information to the Owner for the purposes of receiving Tender Amendments.

90.2.4 Tender Document Order of Priority

If there is a conflict between the various documents referred to in the Tender, document having the highest priority will govern. The order of priority, from highest to lowest, is set out in the General Conditions.

90.2.5 Estimated Quantities

The quantities set forth in a Tender are estimated only unless the Tender specifically states otherwise. Payment is made on the basis of Work actually performed and completed by the Contractor and quantities are measured according to the relevant Specification or Special Provision.

By submitting a Bid, a Bidder acknowledges that the actual quantities used in the Work may be different than the estimated quantities shown on the Price Form. The Owner will use the estimated quantities in evaluating Bids.

90.2.6 Enquiries

A Bidder is solely responsible for obtaining all information that may be necessary in order to understand the requirements of the Tender and to submit a Bid in accordance with the terms and conditions of the Tender.

If a Bidder finds errors, discrepancies or omissions in the Tender, the Bidder should notify the Contract Administrator of the error, discrepancy or omission as soon as possible. If a Bidder is unsure of the meaning or intent of any provision in the Tender, the Bidder should request clarification from the Contract Administrator.

All enquiries related to the Tender must be directed, in writing, to the Contract Administrator identified in the Tender.

Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction or modification to the Tender will be provided by an Amendment.
Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction or modification to the Tender, will be provided by the Contract Administrator only to the Bidder that made the enquiry.

A Bidder is not entitled to rely on any response or interpretation received pursuant to an enquiry unless that response or interpretation is provided in writing by the Contract Administrator or by an Amendment to the Tender.

If a Bidder has sent an enquiry and has not received any acknowledgement of its enquiry, the Bidder should follow up with the Contract Administrator.

Enquiries received within 48 hours of the Submission Deadline may not receive a response from the Contract Administrator.

90.2.7 Amendments

Before the Submission Deadline, the Owner may issue Amendments to the Tender.

The Owner will endeavour to ensure that no Tender Amendments are issued less than 48 hours before the Submission Deadline.

Bidders are responsible for ensuring they have received all Tender Amendments and are advised to check with the Contract Administrator and (where applicable) the Owner’s online procurement service provider website for Tender Amendments before submitting their Bids.

90.2.8 Manitoba Government Wide Contract Policy - Legislative and Safety Requirements

This section applies where the Owner is Manitoba.

A Bidder must complete and submit the Contractor’s Certification Form contained in the Tender and may do so at the time of bid submission. The contract will not be awarded to the successful Bidder without submission of the Contractor’s Certification Form.

Failure to submit the Contractor’s Certification Form within 3 business days upon written request, failing to comply with a commitment made or making an untrue statement in the Certification, or failing to provide additional information satisfactory to Manitoba regarding anything in this Certification, may (among other things) result in forfeiture of the bid bond (if applicable) and/or Manitoba declaring that the Bidder/Contractor is ineligible to bid on future tenders.

The fully executed Contractor’s Certification Form will form part of the Contract.

For details regarding the Contractor’s Certification Form and the Government Wide Contract Policy see the General Conditions 100 or General Conditions 110.

90.2.9 Policy Requirements for Manitoba’s Apprenticeship Employment Opportunities Act (Public Works Contracts)

This section applies where the Owner is Manitoba.

All Contractors and subcontractors must contact Apprenticeship Manitoba to obtain an Apprenticeship Employment Opportunities Act Policy Letter (“Letter”). Apprenticeship Manitoba will assess the scope of Work and operations for all Contractors and subcontractors to determine eligibility to engage in a Contract. Apprenticeship Manitoba will issue the necessary Letters accordingly.

Prior to being awarded the contract, the successful Bidder must submit an Apprenticeship Employment Opportunities Act Policy Letter (“Letter”) from Apprenticeship Manitoba declaring that the Bidder is eligible to be awarded a contract. The Contract will not be awarded to the successful Bidder without submission of the Letter.
Failure to submit the Letter within 3 business days upon written request may result in forfeiture of the bid bond (if applicable) and/or the Province declaring that the Bidder is ineligible to bid on future tenders.

For details regarding the Apprenticeship Employment Opportunities Act (Public Works Contracts) see the General Conditions 100 or General Conditions 110.

SECTION 3 BID PROCEDURES

90.3.1 ONLINE BID SUBMISSION PROCEDURES

Where the Bidder is required to submit a Bid through the Owner’s online procurement service provider, the Bidder will be required to register a user profile with the Owner’s online procurement service provider, and the submission procedures set out on the online procurement service provider website shall apply, including those with respect to Amendment Acknowledgements and bid bond submission. It is solely the Bidder’s responsibility to ensure that its Bid is received by the online procurement service provider before the Submission Deadline. Bids received after the Submission Deadline will not be accepted.

Where the Owner is Manitoba, the online procurement service provider is www.MERX.com.

90.3.2 PAPER COPY BID SUBMISSION PROCEDURES

Where the Bidder is submitting a traditional paper copy Bid, the submission procedures set out in this subsection 90.3.2 shall apply. For greater clarity, the submission procedures set out in this subsection do not apply to Bids submitted using the Owner’s online procurement service provider.

90.3.2.1 Completing the Bidder Information Form

A Bidder must complete and submit the Bidder Information Form contained in the Tender as part of its Bid.

A Bidder must submit a Bid in the Bidder’s full legal name and disclose its usual business name, if that is different than its full legal name. It must also identify the form in which it carries on business (for example, sole proprietor, partnership, corporation or joint venture).

A Bidder must provide the civic address from which it carries on business, and a mailing address if that is different than its civic address.

A Bidder must identify an individual who is authorized to represent the Bidder for purposes of the Bid, and provide all such information about where and how the individual may be contacted as is requested in the Bidder Information Form.

If the Owner requests more information about a Bidder’s legal name or status, address or contact information, the Bidder must provide the Owner with such information within three (3) calendar days of the request. Failure to provide The Owner with the requested information within such time period may result in that Bidder’s Bid being rejected.

90.3.2.2 Completing the Work Schedule Form

A Bidder must complete and submit the Work Schedule Form contained in the Tender as part of its Bid.

The Work Schedule Form details the Liquidated Damages that are applicable to the Contract should the Bidder become the Contractor and fail to complete the Work within the required time. The Bidder is encouraged to refer to the Specification for Liquidated Damages (No. 130) for further information.
90.3.2.3 Completing the Price Form

A Bidder must complete and submit the Price Form contained in the Tender as part of its Bid. The Price Form requires Bidders to provide some or all of the following:

a) a Unit Price and an Item Price for each Work Item for which a quantity is given;
b) an Item Price for each Work Item for which a lump sum price is required;
c) the Item Price Total for each section;
d) a Charged Day Bid also called the Initial Span for each section (if applicable);
e) a Site Occupancy Price for each section (if applicable);
f) the Total Price.

Where a Bidder intends to provide a Work Item free of charge, the Bidder should state “nil” as the Unit Price (if applicable) and as the Item Price for such Work Item. If a Bidder states “0” or “0.00” as the Unit Price (if applicable) and as the Item Price for a Work Item, the Owner will interpret such Unit Price (if applicable) and such Item Price as “nil”.

Unless otherwise stated in the Special Provisions, all Prices on the Price Form must be expressed to the nearest cent. When evaluating a Bid, the Owner will round the price to the first two decimal places of any price that includes fractional cents (i.e. more than two (2) decimal places), in the following order: Unit Price, Item Price, Item Price Total and Total Price.

90.3.2.4 Completing the Signature Form

A Bidder must complete and submit the Signature Form contained in the Tender as part of its Bid.

A Bidder is responsible for ensuring that it has received all Amendments and for considering the effect of such Amendments in formulating its Bid. Bidders should acknowledge having received each Amendment, and the date of each such Amendment, in the space provided for this purpose on the Signature Form. A Bid that fails to acknowledge all of the Amendments may be rejected. If a Bid is submitted before an Amendment is issued, the Owner will accept an Amendment Acknowledgement by letter or re-submission of the Signature Form, in accordance with the Changes to Submitted Bids section.

The Signature Form must be signed by the individual(s) or officer(s) who have the legal authority to bind the Bidder. By submitting a Bid, the Bidder acknowledges that the Owner is entitled to presume the signatures are legally binding.

The name and office of each individual signing the Bid should be printed below the individual’s signature, and the date on which the individual signed should be inserted.

"Bidder" includes all individuals and entities that submit a Bid, if a Bid is submitted by more than one individual or entity. The obligations of the Bid and Contract, if awarded to such a Bidder, are both joint and several.

Bids should be witnessed on the Signature Form. Where a corporate seal is applied to the Bid, a witness signature is not required.

A Bid that is not signed on the Signature Form by the Bidder is invalid and will be rejected.

90.3.2.5 Changes to Forms in a Tender Prohibited

Bidders must submit their Bids using the forms contained in the Tender. Bids that are submitted on one or more forms that are different from the forms contained in the Tender may be rejected by the Owner.
Submission of Bids

By submitting a Bid, the Bidder agrees that:

a) the Tender, in its entirety, is deemed to be incorporated into and to form part of the Bid notwithstanding that all parts of the Tender may not be attached to or accompany the Bid;

b) any changes to the submitted Bid received by the Owner before the Submission Deadline form part of the Bid;

c) if they are the preferred Bidder, the Bidder will enter into a Contract with the Owner to complete the Work in accordance with the Bid; and

d) the Bid will form part of the Contract.

Bids must be submitted before the Submission Deadline to the Submission Location, using one of the submission methods specified in the Tender for this purpose. Bids received by the Owner after the Submission Deadline, or at an incorrect Submission Location, or by an unacceptable submission method, will be rejected.

The Tender indicates which methods of delivery are acceptable for the Bid (e.g. mail, personal or courier delivery, facsimile, e-mail), and the Bidder shall submit the Bid only in accordance with the methods permitted.

Bids that are submitted by mail, personal delivery or courier must be enclosed in a sealed envelope clearly marked with the Tender number. The envelope should also indicate the Bidder’s name and the Bidder’s return address.

The Owner may extend the Submission Deadline by issuing an Amendment to the Tender at any time before the Submission Deadline.

Changes to Submitted Bids

Where a Bidder has submitted a Bid, the Bidder may make changes to the Bid using one of the submission methods specified in the Tender for this purpose. Any changes to a Bid must be received before the Submission Deadline.

A Bid change may be made by letter or by re-submission of a form. All Bid changes must be in writing and signed by a representative of the Bidder with the authority to bind the Bidder. Bid changes must clearly state the name of the Bidder and the number of the Tender to which the change relates, and should state the address of the Bidder. The Bidder must indicate those portions of the Bid that have changed from the Bidder’s original Bid submission.

Where a change affects one or more Prices on the Price Form, the Bidder shall clearly indicate the change to all affected Prices, or resubmit the Price Form.

If, in the Owner’s opinion, there is any ambiguity about the nature or effect of any change, the Owner may reject such a change and evaluate the Bidder’s Bid without regard to the change.

Withdrawal of Bids

A Bidder may withdraw a Bid without penalty at any time before the Submission Deadline by giving written notice to the Owner for this purpose. A Bid withdrawal must be received at the Submission Location before the Submission Deadline.

A notice of Bid withdrawal must be signed by a representative of the Bidder with the authority to bind the Bidder, must clearly state the name of the Bidder and the number of the Tender to which the Bid was responding, and should state the address of the Bidder.
If the Owner receives notice of a Bid withdrawal before the Submission Deadline, the Owner will not consider the Bid during the bid evaluation and will return the Bid to the Bidder only at the request and expense of the Bidder.

90.3.2.9 Confirmation of Bid Receipt

It is solely the Bidder’s responsibility to ensure that its Bid and any Bid change (including any Amendment Acknowledgement submitted subsequent to Bid submission) or Bid withdrawal is received at the Submission Location specified in the Tender prior to the Submission Deadline.

Notwithstanding that a Bidder may be entitled to use facsimile transmission or e-mail to submit, change or withdraw a Bid, the Owner cannot assure Bidders that information or documents sent by facsimile transmission or e-mail will reach the intended recipient before the Submission Deadline. By using facsimile transmission or e-mail, Bidders acknowledge that all risks associated with failed or late delivery are borne by the Bidder. Bidders are responsible for ensuring that the intended recipient received such information or documents by the Submission Deadline.

The Owner will assume responsibility for applying any Bid change to a Bidder’s Bid provided it was received prior to the Submission Deadline.

SECTION 4 CONDITIONS OF BID

90.4.1 Submission of Bid Bond

If a Tender indicates that a bid bond is required, the Bidder must submit a bid bond using the Owner’s standard bid bond form (if available), or in a form satisfactory to the Owner.

Where the Owner is Manitoba, the Bidder must submit an electronic bid bond through the Owner’s online procurement service provider along with the Bid. Manitoba’s bid bond form is provided with the Tender.

The bid bond must clearly state the Tender number and description of the Work.

The amount of the bid bond shall be ten percent (10%) of the Total Price of the Bid excluding Contingency, expressed as a percentage.

The bid bond shall remain in full force, virtue and effect until the earlier of:

a) the date a Contract for the Work of the Tender is executed, or;

b) the date 6 months elapses from the Bid Submission Deadline.

The bid bond must be issued by a surety that is licensed in Manitoba or elsewhere in Canada to carry on the surety insurance business.

90.4.2 Currency and Tax Conditions

All prices must be quoted in Canadian dollars.

Applicable taxes shall be included in all prices shown on the Price Form and shall not be shown separately. Taxes shown separately will be disregarded from all price calculations.

Where Manitoba is the Owner, Manitoba certifies that the amounts payable to the successful Bidder for the Work will be paid by the Government of Manitoba with Crown funds and are therefore not subject to the Goods and Services Tax (GST). The Bidder represents and warrants that the GST has not been included or quoted in any fees, rates or estimates and covenants that it will not include GST in any invoice provided, or request for payment made, under the Contract.
90.4.3 Ownership and Release of Information

Bids that are not withdrawn in accordance with these Bidding Procedures become the property of the Owner after the Submission Deadline.

The Bidder understands that the Owner will publicize information, including detailed price information, contained within the Bid.

The Bidder is advised that any information contained in a Bid may be released by the Owner in original or other forms if authorized or required by the Owner's policies or procedures, including these Bidding Procedures, or by any law, including The Auditor General Act (Manitoba) and The Freedom of Information and Protection of Privacy Act (Manitoba).

90.4.4 Irrevocable Bid Period

The Owner will endeavour to award a Contract within fifteen (15) calendar days; however, Bids are irrevocable for thirty (30) calendar days after the Submission Deadline. A Bidder is bound to enter into the Contract if it is awarded the Contract during this period of irrevocability.

The Owner may request that Bidders agree to an extension of this period of irrevocability. The Bid of each Bidder that consents to such an extension remains irrevocable for the additional time requested by the Owner. The Bid of each Bidder that does not consent to such an extension remains irrevocable for the irrevocable bid period currently in force upon the Bid.

No Bidder has any obligation to enter into a Contract with the Owner upon the expiration of the irrevocable bid period. Where the irrevocable bid period in force upon a Bid has expired, further Bid information will not be released by the Owner provided the Bidder has so requested.

SECTION 5 BIDDER DECLARATIONS

90.5.1 Qualifications of Bidder

In submitting a Bid, the Bidder declares that the Bidder:

a) is incorporated and in good standing under The Corporations Act (Manitoba), registered under The Business Names Registration Act (Manitoba) or otherwise authorized or permitted to legally carry on business in the Province of Manitoba;

b) is financially capable of carrying out the terms of the Contract; and

c) possesses all the necessary experience, capital, organization, and equipment to perform the Work in accordance with the terms and conditions of the Contract.

90.5.2 No Collusion

In submitting a Bid, the Bidder declares and represents that it has not knowingly participated in bid-rigging, collusion, or fraud in the preparation of its Bid. Further, the Bidder declares and represents that it has produced the Bid independently from, and without consultation, communication, agreement or arrangement with, any competitor, except where the competitor intends to become a Subcontractor for a portion of the Work or intends to form a joint venture arrangement with the Bidder.

The Bidder is advised that, under the Competition Act (Canada), the Bidder is responsible for notifying The Owner of any aforementioned agreements or arrangements with its competitors.

90.5.3 No Conflict of Interest

In submitting a Bid, the Bidder declares and represents that the Bidder does not knowingly have a conflict of interest related to the performance of the Work by the Bidder or by its Subcontractors. If the
Bidder is in doubt as to whether individuals or circumstances give rise to a conflict of interest, the Bidder should consult with the Contract Administrator prior to submitting a Bid. The Owner may reject any Bid if, in its sole discretion, the Owner determines that an actual or potential conflict of interest exists.

SECTION 6 EVALUATION OF BIDS

90.6.1 Opening of Bids

Bids received by the Submission Deadline will be opened publicly and read out at the Submission Location immediately after the Submission Deadline. Where e-mail is specified in the Tender as an acceptable Submission Method and one or more Bids are received by e-mail by the Submission Deadline, the Owner will print hard copies of such Bids for the purpose of the public opening.

Where a Tender requires the Bid to be submitted electronically, the Owner will not hold a public opening, but will post the bid results on the Owner’s bid results web page immediately after the Submission Deadline.

Where a Tender requires the submission of a bid bond (whether electronic or hard copy) but the bid bond has not been received prior to the Submission Deadline, the corresponding Bid will not be read out at the public opening, and will be rejected.

All Bids which were read out at the public opening will be evaluated after the public opening.

Anyone may attend the public opening.

90.6.2 Evaluation Process

Bids that were read out at the public opening will be reviewed and evaluated by the Owner after the public opening.

The evaluation of the Bids is a three-step process as follows:

a) Determining Bid Compliance pass / fail
b) Comparing Total Prices

90.6.3 Determining Bid Compliance (Pass/Fail)

The Owner will evaluate all Bids that were read out at the public opening to determine whether they comply with the requirements of the Tender, including these Bidding Procedures.

Those Bids which the Owner determines, in its sole discretion, comply with the requirements of the Tender will progress to the second step of the evaluation process. The Owner may reject a Bid as being non-compliant if the Bid submission is incomplete, obscure, or conditional, or contains additions, deletions, alterations or other irregularities. Those Bids which the Owner determines do not comply with the requirements of the Tender will not progress to the second step of the evaluation but will be rejected and not considered further.

The Owner may also waive irregularities or reject all or any Bids if, in the sole discretion of the Owner, it is considered to be in the best interests of the Owner to do so.

90.6.4 Unit Price and Item Price Omissions

The omission of a Unit Price for a Work Item will not invalidate a Bid provided the Bid identifies an Item Price for such Work Item and provided such Item Price does not represent an amount greater
than ten (10%) percent of the Total Price, excluding Contingency. The Owner will calculate a Unit Price from the Item Price divided by the Estimated Quantity and will enter such amount in the Bid. This calculated Unit Price will be used for making payments in the Contract. If the calculated Unit Price creates mathematical errors, the Bid will be corrected as set out in the section titled Bids with Mathematical Errors.

The omission of an Item Price for a Work Item will not invalidate a Bid provided the Bid identifies a Unit Price for such Work Item. The Owner will calculate the Item Price from the Estimated Quantity multiplied by the Unit Price and will enter such amount in the Bid. If the calculated Item Price creates mathematical errors, the Bid will be corrected as set out in the section titled Bids with Mathematical Errors.

Where a Bidder fails to provide both the Unit Price and the Item Price for a unit price Work Item, the Bid will be rejected.

Where a Bidder fails to provide an Item Price for a lump sum Work Item, the Bid will be rejected.

90.6.5 Bids with Mathematical Errors

Where a Bid contains a mathematical error, the Owner will correct the error. All of the Prices affected by the error will be adjusted, and the Bid will be evaluated on the basis of the corrected Total Price.

Where an Item Price does not equal the product of the Estimated Quantity and the Unit Price, the Owner will consider the Unit Price to be correct and will adjust the Item Price and all other Prices affected by the error.

Where the Item Price Total for a section does not equal the sum of all Item Prices for that section (as indicated by the Bidder or as corrected by the Owner), the Owner will correct the Item Price Total and all other Prices affected by the error.

Where the Site Occupancy Price for a section (if applicable) does not equal the product of the Bid Charged Days and the Charged Day Rate for that section, the Owner will consider the Bid Charged Days to be correct and will adjust the Site Occupancy Price and all other Prices affected by the error.

Where the Total Price does not equal the sum of the Item Price Totals and all Site Occupancy Prices (as indicated by the Bidder or as corrected by the Owner), the Owner will correct the Total Price.

90.6.6 Comparing Total Prices

The Owner will compare the Total Prices of all compliant Bids to determine the Bid ranking. All compliant Bids will be assigned their respective places in order of lowest Total Price to highest Total Price. The preferred Bidder is the Bidder that submitted the compliant Bid with the lowest Total Price, excluding Contingency.

90.6.7 Confirming Qualifications of Preferred Bidder (Pass/Fail)

The qualifications of the preferred Bidder will be assessed, and a Bidder’s record of past performance will be a factor in the Owner’s determination of the Bidder’s qualifications to perform the Work.

For the purposes of assessing qualifications of the Bidder (or the Bidder’s Subcontractors), the Bidder shall, on request of the Owner, provide:

(a) a list of equipment in good working condition that the Bidder is prepared to use in order to undertake the Work;

(b) full access to the Bidder’s equipment or facilities to confirm that the equipment and facilities are adequate to perform the Work;

(c) a plan stating the Bidder’s proposed approach to the various phases of the Work;
(d) a list of Subcontractors whom the Bidder proposed to engage to perform the Work;
(e) examples of the Bidder’s (and where necessary, Subcontractors’) past performance on similar projects;
(f) reference contact information from other agencies or clients for the Bidder (and, where necessary, Subcontractors);
(g) proof, satisfactory to the Owner, of the Bidder’s qualifications as set out in section 9.5.1; and
(h) such other information or documents as may be required by the Tender or the Owner.

The preferred Bidder shall, on request, meet with the Owner’s representatives prior to the Contract being awarded for the purpose of confirming the preferred Bidder’s qualifications.

The Owner has the right to contact not only any of the references provided by the Bidder, but also any other references identified by the Owner who have had dealings with the Bidder or the Bidder’s Subcontractors without prior notice to the Bidder.

If the Owner determines that a Bidder’s qualifications and record of past performance is unsatisfactory, the Owner may, in its sole discretion, disqualify the Bidder and reject its Bid.

If a preferred Bidder is rejected, the Bidder with the second-lowest Total Price becomes the preferred Bidder, and so on until either a Contract is awarded to a qualified Bidder having submitted a compliant Bid or the Tender is cancelled.

A Bidder will be notified, in writing, if its Bid is rejected.

90.6.8 Award and Signing of Contract

The Owner is under no obligation to award a Contract to a Bidder, even if one or more Bids are determined to be compliant and one or more Bidders are determined to be qualified. Without limiting the generality of the foregoing, the Owner will have no obligation to award a Contract where:

(a) there is only one Bid received;
(b) the prices exceed the funds available for the Work;
(c) the prices materially exceed prices for similar work in the past;
(d) the prices materially exceed the Owner’s cost to perform the Work, or a significant portion thereof, with its own forces;
(e) the prices are unbalanced;
(f) in the sole opinion of the Owner, the interests of the Owner would be best served by not awarding a Contract.

If the Owner decides to award a Contract, it will award the Contract to the qualified Bidder that has submitted a compliant Bid with the lowest Total Price excluding Contingency.

The successful Bidder will be notified in writing that the Bidder has been awarded the Contract, subject to the Bidder complying with the specific conditions precedent to the Contract as set out in the Tender or the notification of award.

The Bidder shall, within ten (10) calendar days after the date on which the notification of award was sent to the Bidder, provide evidence to the Owner that the Bidder has satisfied any conditions precedent to the Contract or in the notification of award. Upon receipt of this evidence, the Owner will execute the Contract and send a copy to the Contractor.
90.6.9  Failure to Respond to Award Notification

If, within ten (10) calendar days after the date on which the award notification was sent to the Bidder, the Owner has not received all of the following from the Bidder:

(a) the Contract, duly signed by the Bidder (if applicable);
(b) a performance bond (if applicable);
(c) a labour and material payment bond (if applicable); and
(d) evidence that the Bidder has satisfied any conditions precedent to the Contract;

then the Owner may do one or more of the following:

(a) where a bid bond was required, claim against the bid bond;
(b) declare the Bidder ineligible to bid on tenders issued by the Owner for a period of up to two (2) years;
(c) proceed to award the Contract to, another Bidder;
(d) cancel the Tender;
(e) exercise whatever other remedies are available by law.

90.6.10 Commencement of Work

Unless otherwise authorized by the Owner, in writing, the Contractor shall not commence any Work until the Contractor has:

(a) submitted an approved performance bond (if required);
(b) submitted an approved labour and material payment bond (if required);
(c) complied with the conditions precedent to the Contract;
(d) confirmed that the Owner has executed the Contract that was signed and submitted by the Contractor and,
(e) attended a pre-construction meeting (if required).

90.6.11 No Award of Contract

If no Contract is awarded, the Owner will give written notice to all Bidders, that no Contract award will be made and (where applicable) will post a notice on the Owner's online procurement service provider website that the Tender has been cancelled and no further Bid information will be released, provided the Bidder has so requested.

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SECTION 1  DEFINITIONS AND INTERPRETATION

1.1 Abbreviations

This document shall be interpreted using the abbreviations in the General Conditions 100(I).

1.2 Definitions

This document shall be interpreted using the definitions in the General Conditions 100(I). All definitions employed in this document will be capitalized to indicate a reference to the corresponding definition.

1.3 Interpretation

This Contract shall inure to the benefit of and be binding on the respective executors, administrators, successors and assigns of the Department and of the Contractor.

Where the Contractor as defined herein consists of more than one person or corporation their liability to perform the covenants herein contained to be performed by the Contractor shall be joint and several.

The words "contractor" and "he" or any derivatives thereof shall have a plural, feminine or neuter meaning where the context so requires.

The words “approved”, “directed”, “required”, “considered necessary”, “authorized”, “acceptable”, “satisfactory”, or words of like import, shall mean approved, directed, required, considered necessary or authorized by and acceptable or satisfactory to the Engineer.

This Contract has been entered into and shall be governed by and constructed in accordance with the applicable municipal, provincial and federal laws.

SECTION 2 GENERAL INFORMATION

2.1 Manitoba Government Wide Contract Policy - Legislative and Safety Requirements

2.1.1 Contractor Requirements

To comply with the Province of Manitoba’s Government Wide Contract Policy – Legislative and Safety Requirements, the Contractor must execute a copy of the Contractor’s Certification Form – Legislative and Safety Requirements and comply with all requirements stated therein. Failing to comply with a commitment made or making an untrue statement in the Certification, or failing to provide additional information satisfactory to the Owner regarding anything in this Certification, may result in termination of the Contract, forfeiture of the performance bond (if applicable) and/or the Owner declaring that the Contractor is ineligible to bid on future tenders.

The fully executed Contractor’s Certification Form will form part of the Contract.

2.1.2 Subcontractor Requirements

The Contractor shall collect a fully executed Contractor’s Certification Form from all Subcontractors before the Subcontractor begins any Work. The Contractor shall produce the Contractor’s Certification Form for all Subcontractors on request. Subcontractors that have not provided a fully executed Contractor’s Certification Form will not be permitted to work and may be removed from the Site.
2.1.3 Subcontractor Exceptions

The following subcontractors are not required to submit the Contractor’s Certification Form:

a) Suppliers that are delivering products and are not directly participating in Work activities on the Site (i.e. supply only).

b) Service providers that are not directly participating in Work activities on the Site.

c) Subcontractors without employees (i.e. single owner-operators).

2.1.4 Safety Program Requirements

Where the Total Price of the Contract at the time of award is $100,000 CAD or greater, the Contractor and all Subcontractors with a subcontract value of $100,000 CAD or greater must have one of the safety program certifications listed below.

a) Certification of Recognition (COR™) or other Safework Manitoba sanctioned certifications such as RPM

b) Small Employer Certificate of Recognition (SECOR™)

c) Evidence of COR™ equivalency issued in accordance with the Canadian Federation of Construction Safety Associations COR™ program and verified by either the Manitoba Heavy Construction Association Work Safely Program or the Construction Safety Association of Manitoba.

110. 2.2 Policy Requirements for Manitoba’s Apprenticeship Employment Opportunities Act (Public Works Contracts)

2.2.1 Contractor Requirements

The Contractor must maintain an Apprenticeship Employment Opportunities Act Policy Letter ("Letter") from Apprenticeship Manitoba declaring that the Contractor is eligible to be awarded a Contract.

2.2.2 Subcontractor Requirements

The Contractor shall collect a Letter from all Subcontractors declaring that the Subcontractor is eligible to work on the Contract. The Letter must be collected before the Subcontractor begins any Work on the Contract. The Contractor shall produce copies of the Letter for all Subcontractors on request of the Contract Administrator. Subcontractors that have not provided the Letter to the Contractor will not be permitted to participate in the Work.

2.2.3 Commitment to Continual Employment of Apprentices

Where a Contractor or Subcontractor is employing apprentice(s), the Contractor or Subcontractor, by engaging in the Work of this Contract, commits to continually employing the apprentice(s) for the duration of the Contract. Any apprentices employed by the Contractor or Subcontractor are not required to be on the Site.

SECTION 4 SCOPE OF WORK

110. 4.1 Intent of Plans and Specifications

The plans and the specifications shall be part of the Contract.
When the Contractor is furnished a plan for the Work included in the Contract, it shall be his responsibility to check over and compare it with any other plans furnished and with work then in place.

The Contractor shall keep at least one complete set of the plans and specifications at the site at all times.

Figure dimensions on plans shall be given precedence over scaled ones. In case of an obvious error the dimension most consistent with the Contract shall be accepted.

### 4.2 Alterations in Plans

The Department may, from time to time, make alterations in the plans as determined by the Engineer, and these alterations will not be considered as a waiver of any condition of the Contract.

### 4.3 Items Covered by Unit and Lump Sum Prices

In addition to covering the cost of the items of work described in the Contract, the unit prices and lump sums shall cover the cost of furnishing materials, plant, labour, transportation and incidentals necessary for carrying out the Work.

### 4.4 Contingency (formerly Extra Work)

The amount shown for **Contingency (formerly Extra Work)** shall be included in the Total Price.

The amount shown for **Contingency (formerly Extra Work)** is only an estimate. The actual amount paid to the Contractor under this item will be based on the actual work done and may be nil, less than or greater than the estimated cost.

No **Contingency (formerly Extra Work)** will be paid for unless it has been authorized by an Extra Work Order. The Contractor shall perform all authorized **Contingency (formerly Extra Work)**.

### 4.5 Basis of Payment for Extra Work

When Extra Work is authorized and performed, the Contractor will be paid in accordance with whichever of the following provisions are decided upon:

(a) At the rate or rates as set forth in the Contract for similar work, or

(b) At the rate or rates per unit set out in the Extra Work order, or

(c) At the Contractor’s actual cost. Actual cost is considered to be the total of:

   (i) wages of supervisory staff and employees other than operators of equipment, including overtime payments, plus 30% to cover payments made pursuant to the Workers Compensation Act, Vacation with Pay Act, Unemployment Insurance, Pension Plans, Sick Leave, work breaks and other like employee benefits and payroll costs,

   (ii) the cost of room and board when supplied by the Contractor, for other than operators of equipment, at a standard rate per man-hour,

   (iii) rental of equipment at the rates approved for Department use, of any equipment on or adjacent to the site at the time the Extra Work is carried out. A 10% overhead cost for administration will be added to the rates when the equipment supplied is not owned by the Contractor, Sub-Contractor or an Associated Company,

   (iv) rental of equipment at approved rates, this equipment considered by the Engineer as being necessary to perform the Extra Work and is not included in (iii) above. A 10% overhead cost for administration will be added to the
approved rates when the equipment supplied is not owned by the Contractor, Sub-Contractor or an Associated Company,

(v) cost of materials,
(vi) 15% of items (i) and (v).

4.5 When Extra Work is performed on an actual cost basis, the Contractor shall keep a daily record. The record shall include the names and number of hours worked by each worker and the number of hours worked by each piece of equipment. The record shall be signed by the Contractor or his representative in charge of the work and submitted to the Engineer for approval. Claims for materials in connection with Extra Work shall be submitted by the Contractor to the Engineer, on certified statements, not later than the tenth day of the month following that in which the Extra Work was performed. The Contractor shall submit receipted bills for materials included in the statements.

SECTION 5 CONTROL OF WORK

110. 5.1 Authority of the Engineer

The Engineer will decide all questions which may arise as to:

(a) the quality and acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the Work,
(b) the interpretation of the plans and specifications,
(c) the acceptable fulfilment of the Contract on the part of the Contractor,
(d) disputes and mutual rights between Contractors,
(e) compensation.

The Engineer will have authority to make effective any order which the Contractor fails to carry out promptly.

5.2 Layout of the Work

Where appropriate, construction stakes will be placed by the Engineer to mark the location, alignment and elevation of the Work. The Contractor shall assume full responsibility for dimensions and elevations measured from the stakes and shall be responsible for maintaining all stakes set by the Engineer. The cost of damage to construction stakes caused by neglect on the part of the Contractor will be deducted from the progressive payments.

If an error in the plans, specifications or the directions of the Engineer is suspected, work shall be discontinued until the error is rectified.

Insofar as bridge work is concerned, the Contractor shall supply to the Engineer, as necessary, boats and crew, scaffolding, labour, and any other assistance that may be required by the Engineer.

The Engineer will establish the structure centreline, the location offset stakes for one of the substructure units and one benchmark. The Contractor shall be responsible for all measurements and elevation settings taken from the substructure unit and the benchmark established by the Engineer. The Engineer will check the Contractor's measurements and elevations prior to start of construction.

5.3 Starting Location

The location at which the Contractor commences construction and the sequence of operations will be as permitted or directed by the Engineer.
5.4 Instructions

The Contractor shall, at all times, have a responsible representative in charge of the Work who shall be authorized to receive on behalf of the Contractor written or verbal instructions. Copies of the written instruction shall be signed as having been received by the representative in charge at the time that these are issued.

5.5 Incompetent Worker

Any employee or agent employed by the Contractor who, in the opinion of the Engineer, does not perform the Work in a proper skillful manner, is disrespectful, intemperate, disorderly, or otherwise objectionable, shall, at the written request of the Engineer, be promptly removed from the Work.

The foreman or worker shall not be employed again on the Work without the written consent of the Engineer.

5.6 Protection of Survey Monuments

Before commencing construction, the Contractor shall identify the location of survey monuments located on the site. Monuments disturbed by the Contractor will be restored by the Department. The cost of restoring the monuments will be deducted from the progressive payments.

5.7 Conduct of Operations

The Contractor shall not undertake construction which may interfere with the progress of those engaged in other work for the Department without first discussing, with others, plans for doing the Work. If the parties are unable to arrive at a mutually satisfactory time for doing the Work, the matter shall be referred to the Engineer for his decision. The Contractor shall save harmless the Department from and against all just claims arising as a result of any action on his part or the action of anyone working for him which interfered with the progress of those engaged in other work for the Department.

5.8 Camps

Camps shall be constructed and operated in accordance with the requirements of the appropriate government authorities responsible for public health, safety and the environment.

5.9 Equipment

Equipment to be used for the Work shall be subject to approval and shall be maintained in satisfactory working condition for the duration of the Work. The Engineer shall have access to the equipment at all times for purposes pertaining to the Work. The Contractor shall notify the Engineer prior to removing equipment from the project.

5.10 Roads

At the pre-construction meeting, the Contractor shall review its proposed work plan with the Department prior to commencing any roadwork. The Contractor must demonstrate to the Department that it can re-establish the condition or structure of the road to the satisfaction of the Department prior to seasonal shutdown. Minimum acceptable seasonal shutdown road surface conditions will be reviewed with the Contractor at the preconstruction meeting.

For any incomplete portions of the road, the Contractor will be responsible for damage and road surface maintenance over the seasonal shutdown period. Any direct costs incurred by Manitoba Infrastructure to maintain the road surface will be deducted from the Contractor’s payments.
The Contractor shall, during the term of the Contract, maintain at his expense all haul roads except Provincial Trunk Highways and Provincial Roads between sources of material supply and the Site unless other arrangements have been made with the local authorities. Prior to the commencement of hauling the Contractor shall arrange for an inspection of the roads upon which hauling is to take place. The inspection shall be made by the Contractor, the Engineer and a responsible representative of the Municipality or Territory. During the inspection, notes shall be kept on the condition of each kilometre of haul road.

On completion of the hauling, the same persons, if possible, shall examine the haul roads and determine how much work, if any, the Contractor shall do in order to leave them in as good condition as when hauling commenced. Under no circumstances will the final contract payment be made to the Contractor until at least two of the above noted parties indicate that they are fully satisfied with the conditions of the haul roads.

If, in the opinion of the Engineer, damage is being done to public roads by the Contractor's equipment, the Contractor shall, at his own expense and on the direction of the Engineer, remove the cause of the damage.

5.11 Rejected Work and Materials

Faulty work discovered prior to acceptance of the Work shall be rectified by the Contractor. Rejected material shall be removed from the Site. Should the Contractor neglect or refuse to rectify faulty work, or remove the rejected material, the Engineer will cause the faulty work to be rectified and the rejected material removed. The cost will be deducted from the progressive payments.

SECTION 6 CONTROL OF MATERIALS

110. 6.1 Storage and Care of Materials

The Contractor shall, prior to receipt of material, provide adequate and proper storage facilities and, on receipt of material, promptly place it in storage, except when it is to be incorporated forthwith into the Work. The Contractor shall provide adequate protection for materials that are subject to deterioration during their transportation, handling, storage and use by him. Material supplied by the Department or otherwise, damaged while in the possession of, or under the control of the Contractor, shall be replaced by the Contractor at his own expense.

The Contractor shall give the Supplier and Engineer four days notice of his intention to require the Supplier to provide materials ordered by the Department for the Work. The notice shall state the applicable purchase order number or Contract number. If the Contractor requires the Supplier to provide more material than can be used and it becomes necessary to return it to the source of supply, the Contractor shall pay all delivery and return charges.

The Contractor shall give two days notice of his intention to remove materials supplied by the Department from its storage yard. The notice is to be given to the storekeeper of the storage yard. Materials supplied to the Contractor by the Department shall not be used for any purpose other than that for which they were intended. The Contractor shall be liable for demurrage, rentals and other charges for handling, hauling or storing materials ordered for the Contract.

The Contractor shall, at the time materials are released to him, check and record the quantity of materials. Shortages, discrepancies, or material in bad condition, shall immediately be reported in writing to the Supplier and the Engineer.

The Contractor shall be held responsible for the acceptance, at the point of delivery, of any damaged material, unless, prior to acceptance, the Engineer gives the Contractor a release in writing, from all responsibility in accepting such material.
If a question should arise as to the suitability of any material supplied by the Department for use on the work, such material shall remain in the care of and at the risk of the Contractor until it can be examined and tested by the Engineer to determine its fitness for the purpose for which it was purchased.

Any theft of, loss of, or damage to material after delivery to the Contractor will be charged against him.

6.2 Material from Pits, Quarries, and Other Deposits

Permission in writing shall be obtained by the Contractor prior to removing sand, gravel and quarried material from deposits located on Crown Lands, from

(i) The Department Responsible for Dispositions Under the Mines and Minerals Act, for Crown Lands not controlled by the Department;

(ii) The Engineer, for gravel pits owned or controlled by the Department;

The Contractor shall provide the Engineer with a copy of all permits, related to the project prior to material being produced, stockpiled or hauled in the pit. The Department recommends all permits should be applied for early as some removal permits are subject to waiting periods.

Sand, gravel and quarried materials removed from Crown Lands and used on Department projects is not subject to payment of Royalty. Subject to the approval of the Engineer, the Contractor may use materials from such lands for building and maintaining production facilities and haul roads, necessary for the performance of work, but no payment will be made to the Contractor for such materials or for any work done in connection therewith.

Prior to excavating sand, gravel or quarried materials from crown or privately owned lands the Contractor shall report to the Department Responsible for Dispositions Under the Mines and Minerals Act, the location of the pits or quarries and the proposed date of commencement of operations and shall, immediately after removing sand or gravel, submit a report showing the quantity of each material removed from each pit.

Permission to remove sand, gravel and quarried materials does not guarantee the quality or quantity of the materials.

Surplus aggregate from Crown Lands, produced by the Contractor’s plant, not required or beyond that quantity required for the Contract, shall be neatly piled by the Contractor.

In Department owned pits, the Department will purchase up to a maximum of 10% above the quantity that the Contractor was instructed to crush, at the rates specified in the Provisions for Interim Payment excluding the rate for the supply of raw aggregate. Any quantity over 10% will become the Department’s aggregate.

Surplus aggregate remained in the Department Responsible for Dispositions Under the Mines and Minerals Act controlled pits may be purchased by the Department at the rates specified in the provisions for interim payments, excluding the rate for the supply of raw aggregate or the Contractor may apply for a Stockpile Protection Permit in accordance with the Department procedures.

If the Contractor elects to use a Department owned pit, an Aggregate Resource Management meeting shall be required before the Contractor will be allowed to operate in the pit. It is the Department’s intent to effectively manage the pit resources by matching the raw pit material available with the type of aggregate being produced.
The Contractor shall be required to develop a Pit Usage Plan indicating the area of pit face excavation, location of the crushing machinery, aggregate stockpile sites within the pit and overburden and waste placement location.

The Pit Usage Plan shall be to the satisfaction of the Engineer prior to the Contractor being allowed to operate in the pit.

The Department owned pit located at SE¼ 20-9-17W (locally known as Harris Pit) shall only be utilized for top lift aggregate for bituminous pavement for use on Department projects. The Contractor shall be required to use both the coarse and fine aggregates produced in the bituminous mix design. Excluding the fine aggregates produced in Harris Pit from the mix design will not be permitted.

The Contractor shall obtain permission in writing from the Engineer to produce, remove or stockpile any aggregate from Department owned pits, prior to submitting a tender bid.

If the Contractor elects to produce aggregate by blending material hauled from various sources, the Contractor shall scale, record, and supply to the Engineer in tonnes, any and all materials other than VMA and Binder Material supplied. The Department will supply a scale person for any materials hauled from a Department owned pit.

Upon completing his operations on any lands, the Contractor shall, at his expense, cleanup and vacate such lands and leave them in a condition satisfactory to the Department Responsible for Dispositions Under the Mines and Minerals Act.

6.3 Surplus Material

Surplus materials supplied by the Department, which are not required in construction or permanently incorporated in the work.

The Contractor shall, if required, haul surplus materials to a location designated by the Engineer.

Payment for loading and hauling surplus materials to a designated location will be paid for on the basis of Extra Work.

6.4 Salvaged Materials

When the removal of material to be salvaged is necessary for the satisfactory completion of the Work, the material shall be carefully salvaged, sorted and stored at the Site or at the location specified in the Special Provisions.

SECTION 7 LEGAL RELATIONS AND RESPONSIBILITIES

110. 7.1 Legal Responsibilities and Permits

Entry into this Contract shall not relieve the Contractor of his responsibility to comply with all Acts, statutes, bylaws, regulations or ordinances of the Local, Provincial or Federal Authorities pertaining to the Work.

7.2 Public Convenience and Safety

The Contractor shall take every measure to provide for the safety and convenience of the highway users and residents along the highway and provide and maintain at his own expense access to driveways, houses, buildings or other property contiguous to the highway under construction.
7.3 Care of Various Services

The Contractor shall provide access to and take precautions to prevent damage to services such as railroad facilities, oil pipeline lines, gas pipeline lines, water & sewage pipes, electrical and telephone lines and cables, fire hydrants, manholes and catchbasins. The Contractor shall determine the exact location of such services and conduct his operations so as to avoid the possibility of damaging them. The Contractor shall pay just claims arising directly or indirectly from damage caused by his construction operations and shall save harmless the Department from and against all claims arising there from.

7.4 Workplace Safety and Risk Management

The Contractor shall develop operational safety policies, procedures and plans to prevent loss or injury to any person or property on or travelling through the site. The Contractor shall familiarize himself, his staff and his subcontractors with the terms of the Manitoba Workplace Safety and Health Act W210 and Regulations to ensure complete understanding respecting the responsibilities and compliance required. The Workplace Safety and Health Act W210, Regulations and other related safety information can be obtained from Manitoba Labour, Workplace Safety and Health Branch.

7.4.01 Contractor Responsibility of Employer Duties

By entering into this (Agreement/Contract), the Contractor acknowledges its responsibility to fulfill the duties of the employer under section 4 and section 7.4, if applicable, of The Workplace Safety and Health Act (the "Act") and to ensure that the Services are carried out in accordance with the Act and all applicable regulations.

Without limiting the generality of subsection 7.4.01 the Contractor represents and warrants that:

a) it shall ensure, as far as reasonably practicable, that it will meet the requirements for the protection of workers set out in the Act and the regulations made thereunder;

b) it has a workplace safety and health system or program (the “Program”) applicable to the work being performed and shall carry out the services in accordance with the Program;

c) its employees, agents and subcontractors are properly qualified and trained to perform the Services.

d) Mobile equipment operators shall possess a valid drivers license, as required by the Highway Traffic Act and may be subject to evaluation by the Department;

e) it shall ensure that an adequate number of competent supervisors are provided as prescribed in the Act;

f) it has disclosed all "required information" as required under the Act to all employees and workers that will be providing the Services on behalf of the Contractor under this Agreement to ensure they are trained and informed of the hazards inherent to the work and understand the procedures for minimizing the risk of injury or illness.

g) As prescribed in the current Manitoba Regulation, it shall immediately notify Manitoba Labour, Workplace Safety & Health Division & the Department of any accident of a fatal or serious nature to any of the Contractor’s officers, employees or agents and within five (5) days of the accident provide the Department with a written report detailing the accident and incorporating information requested by the Department;

h) it shall immediately notify and provide the Department with copies of any notices, orders or charges issued to the Contractor under the Act;

i) it shall comply with all reasonable requests and directions made by the Department including, without limitation, any requests or directions made by the Department's project managers.
The Contractor shall indemnify and save harmless the Department from and against all claims for damages arising from any lack of precaution or acts of negligence on the part of the Contractor, Sub-Contractor or their employees.

The Department and the Contractor acknowledge and agree that the Contractor is a "Prime Contractor" as that term is defined in The Workplace Safety and Health Act (Manitoba) for all purposes of that Act and without limiting the generality of the foregoing, it is further acknowledged and agreed that as the Prime Contractor, the Contractor is solely and completely responsible and liable for and in respect of all obligations, requirements and duties imposed on the Prime Contractor in the Act.

The Department and the Contractor further acknowledge and agree that all rights of the Department set out in the Contract allowing the Department to monitor the construction is for the sole purpose of determining the progress and status of the work for payment purposes and to ensure all conditions of the contract are being met.

7.5 Insurance

1. The Contractor shall, at its own expense, provide for and maintain the following insurance:

   A. General Liability Insurance:

      (i) The Contractor shall maintain throughout the term of the Contract, public liability and property damage insurance against claims for personal and bodily injury, death or damage to property arising out of any of the operations, acts or omissions of the Contractor or any of its officers, employees or agents under the Contract, including contingent coverage for all subcontractors; such insurance shall provide, at minimum $2 million ($2,000,000) per occurrence limits of liability, in a form satisfactory to the Government of Manitoba;

      (ii) Such insurance shall include coverage for premises and operations, completed operations, blanket contractual, extended bodily injury, broad form automobile, broad form property damage, non-owned automobile liability, and where applicable, damage to underground property and damage to property, building or land caused by;

         (a) the use of explosives or blasting;

         (b) vibration from pile driving or caisson work; or

         (c) removal or weakening of support of such property, building or land whether such support be natural or otherwise; and

      (iii) Such insurance shall include cross-liability and name the Government of Manitoba, its officers, employees and agents as Additional Insured with respect to operations performed under the Contract. Completed operations coverage shall be maintained for 24 months following completion of the work;

   B. Automobile Liability Insurance

      The Contractor shall obtain and maintain throughout the term of the Contract automobile public liability and property damage liability insurance on all licensed vehicles owned or operated by the Contractor and used on the project, with minimum limits of liability of $2 million ($2,000,000) per vehicle; and

   C. Workers Compensation Insurance

      The Contractor shall obtain and maintain Workers Compensation insurance as required by The Workers Compensation Act. The Contractor shall be registered and be in good standing with the Workers Compensation Board.
2. Notice of Cancellation or Alteration

Where provided, such general liability, professional liability and/or automobile public liability and property damage insurance shall contain a clause which states that the insurers will not cancel, materially alter or cause the policy (ies) to lapse without giving 30 days prior notice in writing to the Province.

3. Certificates of Insurance

When requested by the Department, the Contractor shall submit a certified copy of the general liability policy or certificate in lieu thereof evidencing said insurance. The insurance policy or certificate shall be submitted prior to the date in the Contract where the assessment of working days will commence and/or the date of commencement of Work. As well, when requested by the Department, the Contractor shall submit certified copies of professional liability, automobile public liability and property damage liability and Workers Compensation, policies or certificates in lieu thereof evidencing said insurance.

4. Contractor Shall Not Impair or Invalidate Policies

The Contractor shall not do or omit to do or suffer anything to be done or omitted to be done on the Contract or in performance of the Work which will in any way impair or invalidate such policy or policies.

5. Each Party to Insure Own Property

Each party is responsible for insuring its own property directly or indirectly connected with the Contract and the Work except for materials supplied by the Department as referred to in Section 110.6.1.

6. Course of Construction Insurance for Bridges

Where applicable, structures such as bridges shall be insured by the Contractor against all risks of physical damage or loss, on a full replacement cost basis, through the Course of Construction or Builders' Risk Policy.

7. Professional Liability Insurance

When applicable, the Contractor shall provide for and maintain Professional Liability Insurance.

The Contractor shall ensure that all Consultants engaged or employed by the Contractor or subcontractor maintain Professional Liability Insurance throughout the term of the Contract. "Claims Made Insurance" shall be provided for a minimum of five years following completion of all work and/or services under the contract, insurance against claims arising out of faulty design, maps, plans and specifications or any other error, omission, mistake of a professional or technical nature committed or alleged to have been committed by or on behalf of the Consultant, and provide, at minimum, $2 million ($2,000,000) limits of liability, in a form satisfactory to the Government of Manitoba.

The Contractor shall provide satisfactory written evidence of this insurance as required by the Department.

SECTION 8  PROSECUTION AND PROGRESS OF WORK

110. 8.1 Assigning or Sub-Contracting
The Contractor shall ensure that all Sub-Contractors working on the project have adequate insurance and comply with the Acts and Regulations. The Department may require a list of Sub-Contractors prior to the award of Contract. Requests for information on a Contract by Sub-Contractors and/or suppliers shall be directed to the Contractor, unless otherwise authorized by the Contractor.

8.2 Contract Completion

The time for the completion of the Work contemplated in the Contract will be specified either as a calendar date or as a number of working days. The completion of the Work within the time as specified is an essential part of the Contract.

Should the Contractor fail to complete the Work within the time allotted, or within such extra time as may have been allowed by extensions, the sum set forth as "Liquidated Damages" will be deducted for each and every day that Liquidated Damages may be charged in accordance with the terms of the Contract.

When the Contract has not been completed within the required time, the Contractor shall continue to perform the Work diligently and expeditiously. Permission to continue and finish the Work or any part of it after the time fixed for its completion, shall in no way be considered as a waiver on the part of the Department of any of its rights under the Contract, and time shall continue to be an essential part of the Contract.

8.3 Temporary Suspension of Work

The Engineer may suspend the Work wholly or in part by written order for such period as he may deem necessary due to conditions considered unfavourable for the suitable prosecution of the Work, unsuitable weather, failure on the part of the Contractor to correct unsafe conditions, failure to carry out orders given or failure to perform any provisions of the Contract.

8.4 Extensions of Time

The time set forth in the Contract for its completion may be extended free of liquidated damages;

- When the Contract is not completed within the required time because the Contractor was ordered to perform unspecified Extra Work, the Engineer will extend the number of days allowed for completion by the number of days required to perform the Extra Work.

- When the Contract is not completed within the required time because of increases to the original quantities, the Engineer will extend the number of days allowed for completion based on the following formula:

\[
E = \frac{F \times D - D}{O}
\]

- By the Director, in the form of a written approval, when:
  
  (i) The Contractor is able to prove conclusively that conditions encountered during the work were much more difficult than could reasonably have been anticipated and,

  (ii) The Contractor submits a request for an extension of time accompanied by evidence of the difficult conditions and forwards it to the Director prior to completion of the Contract.
No claims for damages shall be made against the Department on account of delays on the part of
the Department in the delivery of materials or in the performance of work; but should there be
unduly prolonged delays upon the part of the Department in the delivery of any materials required
for the Work or in the performance of the Work, the Contractor shall be entitled to a corresponding
extension of time to complete the Work.

8.5 Termination of Contract

Notwithstanding any extension of time, if at any time prior to the completion of the Contract, for any
cause whatsoever, whether or not due to the fault of the Contractor, Sub-Contractor, or the
employees of either of them, or otherwise, the Work, in the opinion of the Director, is not being
performed in accordance with the terms of the Specifications and the Contract, or is not
progressing satisfactorily, or is not likely to be completed within the time specified, the Department,
after forty-eight hours notice given to the Contractor or his agent, may re-let the Work and enter into
a new Contract for the whole or any part of the uncompleted work, or otherwise cause said work or
any part thereof to be completed, and pay for same out of any monies of the Contractor which may
be due or accruing due him from the Department, and may further charge the Contractor with the
amount of any money which the Department may have spent in connection with such work over
and above the monies aforesaid of the Contractor, and may collect the same as a debt due from
the Contractor to the Department. The Department reserves the right to take over and use any
plant and materials being used in the Work. The Contractor hereby agrees that he will not remove,
dispose of, nor transfer his rights in any of the plants or materials after he has received the above-
mentioned forty-eight hours notice, and any assignment or transfer made in contravention of this
provision is invalid.

The normal penalty for non-performance will be removal from the bidders list for two years.
Reinstatement after two years will be on approval of the Department.

8.6 Opening to Traffic

The Work shall not be open to traffic until authorized by the Engineer. When, in the opinion of the
Engineer, the Work or any portion thereof, is in an acceptable condition for travel, it shall be opened
to traffic as may be directed by the Engineer, but such opening shall not be construed as an
acceptance of the roadway, or any part of it, or as a waiver of any of the provisions of the Contract
or of the Specifications.

Necessary repairs or renewals made on any section of the roadway due to its being open to travel,
under instructions from the Engineer, and to ordinary wear and tear, or otherwise, prior to the
completion and acceptance of the roadway, shall be performed at the expense of the Contractor.

If the Contractor is dilatory in completing certain phases of the Work, the engineer may order the
road open to traffic. In such an event, the Contractor, prior to final acceptance, shall not be relieved
of his liability and responsibility during the period the road is so opened.

Where the Work is divided into sections, upon application by the Contractor, the Department may
take over for maintenance any section which may be found to be completed in a satisfactory
manner. No such section will be taken over unless it connects with a completed section or road;
said taking over shall not be deemed to be final acceptance of the Work or in any way prejudice the
rights of the Department under the Contract or otherwise.

8.7 Maintenance

The Contractor shall satisfactorily maintain the Work described in the Contract until the final
acceptance of the Work.
8.8 Cleaning Up

The Contractor shall conduct all his day to day operations in such a manner as to avoid creating any unpleasant appearances or any conditions that will be detrimental to or mar the surrounding area or waterways. Waste materials and refuse shall be promptly disposed of in a manner that will not contaminate or mar the surrounding area or waterways.

Upon completion and before final acceptance of the Work, the Site occupied by the Contractor in connection with the Work shall be cleaned of rubbish, excess materials, temporary structures, and equipment; and all parts of the Work shall be left in an acceptable condition.

8.9 Final Acceptance of Work

Until final completion and final acceptance of the Work, the Work shall be under the charge and care of the Contractor, and he shall take every necessary care against damage to the roadway or any part of the Work by the action of the elements, or from any other cause whatsoever arising from the execution of the Work or from the non-execution of the Work. The Contractor shall rebuild, repair, restore and make good, at his own expense, all damages to any portion of the roadway or any part of the Work, occasioned by any of the above mentioned causes, before final completion and acceptance.

When work has been completed according to the plans and specifications and upon certification of the Engineer, final acceptance of the Work will be made by the Department.

SECTION 9 CLAIMS AND PAYMENTS

110. 9.1 Claims for Adjustments

As time is of the essence, every effort must be made to resolve disputes at the field level as they occur. Resolution on claims against the Department should be achieved in one or two days at the maximum. Should it not be possible to resolve the dispute in this manner, then the Contractor shall submit the claim in writing to the Section Head. The claim must show justification and background calculations.

(i) The Section Head will investigate and respond to the claim in writing within 7 days of receipt, with copies to the Director responsible for the project and the Executive Director of Construction and Maintenance.

If the claim is considered invalid the response should include why the Department does not feel the claim is valid.

If the claim is deemed valid but the Department does not agree on the compensation requested, the Contractor should be contacted and a meeting set up to determine fair compensation.

Quality Assurance will participate in the meeting in an advisory capacity, when requested.

(ii) The Contractor may appeal the decision of the Section Head to the Director responsible for the project. The Director shall respond within 7 days.

(iii) The Contractor may request that the Executive Director of Construction and Maintenance review the decision made by the Director responsible for the project.

(iv) In the event that the dispute or claim cannot be resolved by the Executive Director of Construction and Maintenance, the dispute or claim may, with the consent of both the Department and Contractor, be forwarded to binding arbitration in accordance with the provisions of The Arbitration Act, except that any decision of the arbitrator will be final and binding and not subject to appeal.
9.2 Changes in Quantity

Unless the contract provides otherwise, adjustments in contract unit prices for increased or decreased quantities shall be governed by the following provisions:

1. Major Contract Item means a contract item representing at least 7% of the Total Price of the Contract, excluding Contingency.

2. If the final quantity of a Major Contract Item is within 20% of the estimated quantity, there will be no adjustment to the contract unit price.

3. If the final quantity of a Major Contract Item is less than 80% of the estimated quantity and the Total Price, excluding Contingency is under by a minimum of 15%, the Contractor may submit a written request for an adjustment of the contract unit price. The Department will consider the request subject to the following limitations:
   a) an adjustment will be considered only to the extent that the decrease in the quantity justifies an increase in the pro-rata share of fixed expenses chargeable to that Major Contract Item.
   b) Fixed expenses will be deemed to be 20% of the bid price.
   c) no allowance will be made for anticipated profits on any work not performed.
   d) the total adjusted payment shall not exceed 80% of the payment which would be made for the estimated quantity at the contract unit price.

The method used to adjust the unit price will be as follows:

- Determine the Fixed Cost = 20% x Unit Price
- Determine the balance of Unit Price = Unit Price - Fixed Cost
- Calculate Adjusted Fixed Cost rounded to nearest cent
  \[= \text{Fixed Cost} \times \frac{\text{Estimated Quantity}}{\text{Actual Quantity}}\]
- Calculate the Adjusted Unit Price
  \[= \text{Balance of Unit Price} + \text{Adjusted Fixed Cost}\]

4) If the final quantity of a Major Contract Item is more than 120% of the estimated quantity, either party may submit a written request to the other for an adjustment of the contract unit price. The request will be considered by the party receiving it subject to the following limitations:
   a) the contract unit price shall apply to all quantities up to and including 120% of the estimated quantity.
   b) if adjusted, the adjusted unit price shall apply only to the quantities in excess of 120% of the estimated quantity.

5) Any request for an adjustment of the contract unit price shall be:
   a) in writing.
   b) received no later than 30 days after the Department has notified the Contractor of the final quantities, and
   c) accompanied by supporting evidence.

6) Nothing in this section shall excuse the Contractor from proceeding with the Work.

9.3 Financial Obligations of Contractor

The Contractor shall pay every just claim for the cost of work, service or material made by a person who performs any work or service, or places or furnishes material to be used in the performance of the Contract. The payment of every such claim by the Contractor shall be an obligation under the
Contract. So long as any such claim remains unsatisfied the Contract shall be deemed to be uncompleted.

Where a written claim for the cost of work, service or material is placed by a third party, the Department will retain from any funds still owing to the Contractor an amount equal to the claim as the minimum holdback until the claim is satisfied.

When requested, the Contractor shall supply a statement showing all obligations incurred by the Contractor in connection with the Work and remaining unpaid at the date of submission of the statement. Supplying such a statement shall be a condition precedent to the payment of any money due the Contractor under the Contract.

9.4 Sales Tax

The Manitoba Government is not subject to payment of the Goods and Services Tax (GST), therefore all prices shall exclude Goods and Services Tax. The Department will issue a statement certifying the goods and services provided under this contract are for the sole use of the Manitoba Government.

All other applicable Provincial and Federal Sales Taxes will not be reimbursed to the Contractor or paid on behalf of the Contractor but are considered included in the applicable unit or lump sum prices. Sales Tax will not be paid as a separate item.

9.5 Workers Compensation Payments

The Contractor shall be registered and be in good standing with the Workers Compensation Board.

Should the Contractor fail to pay to the Workers Compensation Board, premiums on the wages of his employees, or compensation awarded by the Workers Compensation Board in respect to the Work, the Department may deduct from any money due the Contractor under the Contract a sum sufficient to pay all of such amounts to the Workers Compensation Board.

9.6 Payments to Contractor

Progress payments will be based on estimates prepared and certified by the Engineer.

The total amount paid to the Contractor will be determined by multiplying the actual quantities of work, which have been certified by the Engineer, by the applicable unit prices, plus payments for work actually performed for which the basis of payment is a lump sum amount, plus payments for extra work actually performed.

When, in the opinion of the Engineer, lump sum prices are unbalanced, the payments for the applicable lump sum item may be made on a pro-rata basis over the life of the Contract.

On payments made prior to completion of the Contract, 15% of the amount of each payment will be retained as holdback.

Where a Contract is estimated to be 75% complete in terms of dollars and work is stopped for a seasonal shutdown, the Contractor may request a reduction in holdback to the Department. If approved, the Department may reduce the holdback to 7.5% or $1,000.00, whichever is the greater, providing the Contractor submits a written request certifying that all just claims against the Contractor in connection with the Contract have been paid.

Payment for any reduction in holdback will be held for 40 days after the date the Contractor last worked.
The Department will release the final payment providing;

i. The Engineer has accepted the completed work.

ii. There are no outstanding claims of which the Department has been notified.

If, four months after the completion of the Work on a Contract the Department is unable to finalize the Contract due to outstanding claims, the Department shall proceed in accordance with the procedures outlined in the Highways and Transportation Construction Contracts Disbursement Act or The Builder's Liens Act.

Neither the final inspection and acceptance, nor the final payment, nor any provision in the Contract shall relieve the Contractor of his responsibility for complying fully with all the terms and conditions of the Contract, and he shall remedy any defects or omissions arising out of non-compliance therewith that appear within one year after the date on which the final estimate, issued in accordance with the terms of the Contract, has been approved and paid, and he shall save harmless the Department from and against all claims for damages to persons or property arising out of any such defects or omissions, or the remedying thereof.

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SPECIFICATION FOR LIQUIDATED DAMAGES

130. 1 SCOPE

These specifications are intended to outline the assessment of Liquidated Damages for contract completion specified by calendar date, working days or site occupancy.

130. 2 DEFINITIONS

2.1 Charged Days

Means the unit of measurement for Site Occupancy as a Liquidated Damage.

2.2 Initial Span

Means the number of Charged Days Bid by the Contractor for Site Occupancy on the Tender Price Form.

2.3 Final Span

Means the number of Charged Days assessed for Site Occupancy as calculated pursuant to these Specifications.

2.4 Spring Road Restrictions

Means that period of time pursuant to subsection 86(1) of Manitoba’s Highway Traffic Act, used to restrict vehicle weights.

2.5 Twenty-Eight Day Period

Means a period of twenty-eight (28) days as shown on a calendar including weekends and holidays applicable to a Site Occupancy contract. The first period will commence on the first Charged Day assessed to the Contract. All subsequent periods will commence on the first day following the previous 28 day period.

2.6 Equipment

On grading and surfacing projects equipment will be interpreted to mean equipment and trucks normally working and travelling on the highway embankment. On depositing and stockpiling aggregate projects equipment will be interpreted to mean the crusher, screener or hauling vehicles.

2.7 Seasonal Shutdown Date

The date identified in the Contract as the Seasonal Shutdown Date.

130. 3 LIQUIDATED DAMAGES

In the event that all of the work on a project is not completed within the specified time limit damages will be sustained by the Department. It will be impractical and extremely difficult to ascertain the actual damage which the Department will suffer by reason of such delay. The sum set forth as Liquidated Damages or a Charged Day Rate is not a penalty but is an estimate of the cost to the Department and the Public for engineering, inspection, supervision, administration,
continuing maintenance costs, road user costs, delay costs, safety costs, budget delay costs and other costs which will accrue after the specified time limit.

The Department will deduct, from the Contract payments, the sum set forth as daily Liquidated Damages, lump sum Liquidated Damages and/or Charged Days required to complete the work after the specified time limits.

The Engineer’s certification as to the number of days for which Liquidated Damages will be charged will be final and binding on all parties.

130. 4 COMPLETION SPECIFIED BY COMPLETION DATE

4.1 General

A Completion Date is specified in the Contract by when the Contractor must complete the Work.

4.2 Assessment of Liquidated Damages

When Work has not been completed by the specified Completion Date, the Engineer will charge liquidated damages, at the rate stated in the Contract, for every calendar day that the Work remains incomplete after the specified Completion Date, except:

- On days where the Contract special provisions require the Contractor to cease construction operations at 4:00 p.m. or earlier, only ½ day will be charged.
- If the Contractor elects not to work on any one of the following days:
  - A Saturday; or
  - A Sunday; or
  - A Statutory Holiday,

Liquidated Damages will be assessed on a Saturday, Sunday or Statutory Holiday if the Contractor chooses to work on that day.

130. 5 COMPLETION SPECIFIED BY WORKING DAYS

5.1 General

A Working Day allotment is identified in the Contract and represents the maximum time available to the Contractor in which to complete the Work. As the Work progresses, Working Days are assessed in accordance with the ‘Assessment of Working Days’ section below and are deducted from the allotment of Working Days. When the allotment of Working Days have been exhausted, Liquidated Damages are assessed in accordance the ‘Assessment of Liquidated Damages’ section below.

5.2 Assessment of Working Days

A Working Day will be any day, when in the opinion of the Engineer, atmospheric and highway conditions are such that 70% of the Contractor’s equipment normally expected to work on the highway is able to work at least seven hours between 7:00 a.m. and 6:00 p.m. with the following exceptions;

- On days where the Contract special provisions require the Contractor to cease construction operations at 4:00 p.m. or earlier, only ½ day will be charged.
- If the Contractor elects not to work on any one of the following days:
  - A Saturday; or
then that day will not be assessed as a Working Day.

A Saturday, a Sunday or a Statutory Holiday will however be considered a Working Day if the Contractor elects to perform work requiring more than one Department employee’s presence, providing the Contractor is able to work at least 7 hours between 7:00 A.M. and 6:00 P.M.

The Engineer will commence assessing Working Days on whichever of the following dates is earlier:

a) the date specified by the Department on the Work Schedule, or in the Special Provisions; or

b) the date on which the Contractor commences work on any Item of Work listed by the Department on the Work Schedule.

Work not listed on the Work Schedule may be undertaken without Working Days being assessed provided that the work occurs prior to the start of the assessment of Working Days and prior to the Contractor commencing work on an Item of Work listed on the Work Schedule.

Notwithstanding the above, Working Days will not be assessed for the first seven calendar days after the award date regardless of the start date in the contract, provided that the Contractor has not started operations on an Item of Work identified on the Work Schedule.

If the Contractor starts work on an item listed in the Work Schedule on or before the award date, the assessment of Working Days will commence on the award date.

Working Days, once commenced, will continue to be assessed until all Work has been completed.

The assessment of Working Days will normally cease when all major items listed in the Work Schedule have been completed. If the remaining work consists solely of final trimming of shoulders on base and paving projects, or final trimming of slopes and roadways on grading jobs, then those items will be considered complete for the purpose of assessment of Working Days. If the Contractor is not making a reasonable effort to complete the trimming, then Working Days will continue to be assessed.

5.3 Periodical Leave

The Contractor may request, in writing, to accumulate periodical leave days. If approved, Working Days will be assessed seven days a week during the accumulation of periodical leave days. The Contractor will be allowed to accumulate periodical leave days at the rate of two days per week to a maximum of six consecutive days. When approved, the Contractor may use the accumulated periodical leave days and will not be assessed Working Days during this time. No work will be permitted during periodical leave days.

5.4 Assessment of Liquidated Damages

When the allotment of Working Days has been exhausted, the Engineer will charge liquidated damages at the rate stated in the Contract, for each subsequent calendar day that qualifies as a Working Day as described in Section 5.2.
Site Occupancy is a system for monitoring and administering progress of the Work. The Site Occupancy completion model has two components; Charged Days and Liquidated Damages associated with a Completion Date(s).

6.2 Bidding Charged Days

The Bidder shall provide a bid for Charged Days under the "Charged Days Bid" column on the Price Form. This is the Bidder’s estimated days to complete the Work. A failure to provide a bid for Charged Days will result in rejection of the Bid.

The number indicated by the Bidder for the quantity of Charged Days Bid shall be a whole number. If a part of a day is indicated, that quantity will be rounded up to the nearest whole number and the Site Occupancy Price will be recalculated.

The Contractor shall also provide a Site Occupancy Price by multiplying the “Charged Days Bid” by the “Charged Day Rate” (set by the Department). The Site Occupancy Price on the Price Form will only be used for the purpose of comparing bids and will not form part of the Contract Price as defined in General Conditions Clause 100.1.2. Additionally, contrary to specification 100.9.2, Site Occupancy will not be considered a Major Contract Item.

6.3 Assessment of Charged Days

The total amount of Charged Days assessed will be measured in whole numbers.

Charged Days will be assessed for every day except for the following:

- Days prior to the Contractor starting work on the Contract. The Contractor shall provide a minimum of 14 days notice to the Department for commencement of the work. Failure of the Contractor to commence work as indicated, in the opinion of the Engineer, may result in the assessment of Charged Days;
- Days the Contractor is prohibited from working due to restrictions outside the Contractor's control that are imposed by Public Authorities that come into effect after the Contract is awarded;
- Days the Contractor schedules employee time off subject to the following conditions:
  The Contractor will be granted a maximum of eight (8) Non-Charged Days per Twenty-Eight Day Period (including holidays) for the purpose of allowing employee time off providing:
  a) The Engineer is given at least 3 days notice;
  b) There is no ongoing work that requires the presence of Department personnel, as determined by the Engineer;
  c) Any of the days allowed for employee time off not used in the specified Twenty-Eight Day Period may not be carried over to subsequent Twenty-Eight Day Periods;
  d) The 8 days allowed for employee time off will be pro-rated for periods shorter than twenty-eight days;
- Days the Contract is delayed due to inclement weather subject to the following conditions:
  a) The Contractor is prevented from utilizing at least 70% of the total labour and equipment engaged on the controlling operation for at least 7 hours, as determined by the Engineer; or
  b) The Contractor is ripping, drying, re-laying material or performing other measures to restore the material to its pre-existing condition, as determined by the Engineer.
- Days on which work has been suspended by the Engineer because of an action or omission by the Province;
• Days not worked due to Acts of God or the Public Enemy, Acts of the Province or any foreign state, floods, epidemics, quarantine restrictions, strikes, embargoes, or delays due to such causes, alterations or changes in Plans, or any other reason not originally contemplated by the Contract;

• Days not worked because of Spring Road Restrictions in the Final Span;

• Days for clearing and grubbing provided that charge days have not commenced;

• Days for aggregate production;

• Beginning one day after the final acceptance of the road surface approaches and side slopes excluding the installation of rumble strips, trimming, and seeding. Charged Days may continue to be assessed, if in the opinion of the Engineer, the Contractor is not making a reasonable effort to complete the rumble strips, trimming, and seeding;

• Any other conditions specified in the Contract.

6.4 Calculation of Site Occupancy Final Span

Extensions to the Initial Span will determine the Final Span and will be calculated as follows:

\[
\text{Final Span} = \frac{F \times I}{A}
\]

Where:

Final Span = adjusted number of Charged Days allowed (a fraction of a day will be rounded up to a full day);

*\(F\) = Final Contract Amount (excluding Mobilization of Equipment, Traffic Control, Extra Work, Fuel Cost Adjustment, Liquidated Damages, Riding Bonus and Site Occupancy);

\(I\) = Initial Span of the Contract

*\(A\) = Total Amount at Award (excluding Mobilization of Equipment, Traffic Control, Extra Work, Riding Bonus and Site Occupancy).

6.5 Payment for Site Occupancy Charged Days

Payment for Site Occupancy will be made as follows:

• If the number of assessed Charged Days equals the Final Span, no payment will be made;

• If the number of assessed Charged Days is less than the Final Span, a payment equal to the Contract Unit Price per Charged Day multiplied by the difference between the Final Span and the actual number of assessed Charged Days will be made;

• If the number of assessed Charged Days exceeds the Final Span, a deduction equal to the Contract Unit Price per Charged Day multiplied by the difference between the actual number of assessed Charged Days and the Final Span will be made.

6.6 Assessment of Liquidated Damages

When Work has not been completed by the specified Completion Date, the Engineer will charge liquidated damages at the rate stated in the Contract, for each calendar day (with no exceptions) that the Work remains incomplete after the specified Completion Date.

130. 7 Seasonal Shutdown Conditions
7.1 Seasonal Shutdown Date

The Seasonal Shutdown Date, if required, is identified in the Contract and is set based on the seasonal conditions that are expected to interrupt the Work. The Contractor is expected to occupy the Site and attempt the Work until the Seasonal Shutdown Date. At the Contractor’s option, the Contractor may remain on Site and continue to attempt the Work beyond the Seasonal Shutdown Date. Whether or not a specific year is stated in the contract, the Seasonal Shutdown Date will apply to each subsequent year on a recurring annual basis while the Work remains incomplete.

7.2 Completion Specified by Completion Date

Where a Seasonal Shutdown Date is identified in the Contract, the assessment of daily Liquidated Damages will cease between the latter of the Seasonal Shutdown Date or the actual day the Contractor ceases operations. The assessment of daily Liquidated Damages will recommence the earlier of 7 calendar days after the lifting of Spring Road Restrictions or the actual day the Contractor recommences operations the following year.

Where a Seasonal Shutdown Date is not identified in the Contract, the assessment of daily Liquidated Damages will continue until the Work is complete.

7.3 Completion Specified by Working Days

Where a Seasonal Shutdown Date is identified in the Contract the assessment of Working Days or daily Liquidated Damages will cease between the latter of the Seasonal Shutdown Date or the actual day the Contractor ceases operations. The assessment of Working Days or daily Liquidated Damages will recommence the earlier of 7 calendar days after the lifting of Spring Road Restrictions or the actual day the Contractor recommences operations the following year.

Where a Seasonal Shutdown Date is not identified in the Contract, the assessment of Working Days or daily Liquidated Damages will continue until the Work is complete.

7.4 Completion Specified by Site Occupancy

Where a Seasonal Shutdown Date is identified in the Contract, the assessment of Charged Days and/or daily Liquidated Damages will cease between the latter of the Seasonal Shutdown Date or the actual day the Contractor ceases operations. The assessment of Charged Days and/or daily Liquidated Damages will recommence the earlier of 7 calendar days after the lifting of Spring Road Restrictions or the actual day the Contractor recommences operations the following year.

Where a Seasonal Shutdown Date is not identified in the Contract, the assessment of Charged Days and/or daily Liquidated Damages will continue until the Work is complete.

130. 8 EXTENSIONS OF TIME

The time set forth in the Contract for its completion may be extended:

a) When the Contract is not completed within the required time because the Contractor was ordered to perform unspecified Extra Work which interrupted major contract activities or operations, the Engineer may extend the number of days allowed for completion by the number of days required to perform the Extra Work. The time extension will be at the discretion of the Engineer.

b) Where completion is specified by Working Days, when the Contract is not completed within the required time because of increases to the original contract quantities, the Engineer will extend the number of Working Days allotted for completion based on the following formula:
\[ E = \frac{F \times D}{O} - D \]

- **E** = Extension of time in Days (Rounded off to nearest day)
- **F** = Finished Contract Value
- **D** = Number of Working Days allotted in the Contract
- **O** = Original Contract Value

**c) By the Director, in the form of a written approval, when:**

I. The Contractor is able to prove conclusively that conditions encountered during the work were much more difficult than could reasonably have been anticipated; and,

II. The Contractor submits a request for an extension of time accompanied by evidence of the difficult conditions and forwards it to the Director prior to completion of the Contract.

When the Contract is not completed within the time limit due to Acts of God or the Public Enemy, Acts of the Province or any foreign state, Floods, Epidemics, Quarantine Restrictions, Strikes, Embargoes, or delays due to such causes, alterations or changes in Plans, or any other reason not originally contemplated by the Contract, the Director, on written request, may extend the time limit.

Delays incurred as a result of seasonal changes and adverse weather should be anticipated by the Contractor and are not compensatory but may be eligible for extensions of time in extraordinary circumstances.

In the event an extension of time is granted, time shall continue to be the essence of the Contract.

No claims for damages shall be made against the Department on account of delays on the part of the Department in the delivery of materials or in the performance of work; but should there be unduly prolonged delays upon the part of the Department in the delivery of any materials required for the work or in the performance of the work, the Contractor shall be entitled to a corresponding extension of time to complete the work.

**130. 9 CONSIDERATIONS DURING SPRING ROAD RESTRICTIONS IN SEASONAL SHUTDOWN**

The Contractor may elect to haul restricted loads during Spring Road Restrictions and will not be assessed Liquidated Damages, Working Days or Charged Days only when a Seasonal Shutdown is in effect.

Where overweight permits affecting required movement of equipment to the project are denied for a further period of time after Spring Road Restrictions have been lifted, assessment of Liquidated Damages, Working Days or Charged Days will commence the earlier of 7 calendar days after the date overweight permits are approved or on the date the Contractor starts work on an item listed in the Work Schedule.

**130. 10 CONSIDERATIONS DURING FISH SPAWNING RESTRICTIONS**

Where the Contract restricts Work in or around a fish bearing water body during a fish spawning period, the Contractor will not be assessed Liquidated Damages, Working Days or Charged Days where the restriction interrupts a major contract activity.
130. 11  EQUIPMENT SUMMARY AND DAILY ASSESSMENT RECORD

The Engineer will maintain an Equipment Summary and Daily Assessment Record. This record is necessary to document the assessment of Working Days, Charged Days and Liquidated Damages.

The Contractor shall initial the Record to certify that the information is correct. One week will be allowed for the Contractor to file a written protest setting forth in what respect the Record is considered incorrect; otherwise the Record for that week will be deemed to have been accepted by the Contractor.

Copies of the Record will be provided to the Contractor on a weekly basis.
SPECIFICATIONS FOR
SUPPLY, FABRICATION AND DELIVERY OF STRUCTURAL STEEL

1.0 DESCRIPTION

The Work shall consist of:

.1 The supply of materials and fabrication of structural steel components (e.g. girders, diaphragms, jacking beams, stiffeners, girder coverplating) as shown and described on the Drawings and in this Specification;

.2 The supply of all associated welding consumables and the necessary welding;

.3 The handling and storage;

.4 The loading and transportation of fabricated components to the job site; and

.5 The quality control testing of all materials.

The Contractor shall notify the Department of any sub-contractors (Fabricators) that have been sub-contracted by the Contractor to fabricate, load or transport the structural steel components. The Contractor shall remain responsible for the work of such sub-contractors. All requirements, such as right of access, shall apply to such sub-contractors.

2.0 REFERENCES AND RELATED SPECIFICATIONS

The latest edition of the following standards, specifications and publications are applicable to the Work described under this Specification:

2.1 References

Canadian Standards Association (CSA)

G40.20/G40.21 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels
S16 Design of Steel Structures
W47.1 Certification of Companies for Fusion Welding of Steel Structures
W48 Filler Metals and Allied Material for Metal Arc Welding
W59 Welded Steel Construction (Metal Arc Welding)
W178.1 Certification of Welding Inspection Organizations
W178.2 Certification of Welding Inspectors

Canadian Institute of Steel Construction (CISC))

Handbook of Steel Construction

Canadian General Standards Board (CGSB)

48.9712 Nondestructive Testing - Qualification and Certification of Personnel
American National Standards Institute (ANSI)

B46.1 Surface Texture (Surface Roughness, Waviness and Lay)

ASTM International

A 325 Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
A 325M Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength [Metric]
A 490 Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
A 490M High Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints, [Metric]
A 563 Carbon and Alloy Steel Nuts
A 563M Carbon and Alloy Steel Nuts [Metric]
A 588/A 588M High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance
F 436 Hardened Steel Washers
F 436M Hardened Steel Washers [Metric]

American Welding Society (AWS)

AWS A5.XX - XX: All Applicable Filler Metal Specifications
AWS D1.1/D1.1M Structural Welding Code – Steel
AWS D1.5/1.5M Bridge Welding Code

International Organization for Standardization/ International Electrotechnical Commission

ISO/IEC 17025:1999 General Requirements for the Competence of the Testing and Calibration Laboratories

Definitions

Bearing Contact Area: the overlapping area between two steel plates either in contact with one another or that have a separation not greater than 0.1 mm between them.

Erection Diagram: complete set of drawings prepared by the Fabricator showing the dimensioned layout of the steel structure from which Shop Drawings and details are made and that relate the structural steel fabricator’s piece markings with the piece locations in the finished structure.

Faying Surface: the interface between two structural steel members bolted together.

Fracture-Critical Member: a structural steel component of the bridge that is subject to tensile stress in the permanent condition whose failure could lead to a collapse of the bridge or a collapse of a bridge span.

Inspector: refers to a person that is a Canadian Welding Bureau certified Level II or Level III welding inspector in accordance with CSA W178.2 and whom has proven and documented knowledge and experience in the fabrication of structural steel for bridges.
**New Steel**: structural steel that has not been previously used in any application whether permanent or temporary.

**Non-Destructive Testing Technician**: refers to a person holding a valid certificate qualification to a Level II or Level III according to CAN/CGSB 48.9712 and the CWB for the specific non-destructive testing method specified or required.

**Primary Tension Member**: a structural steel component of the bridge that is subject to tensile stress in the permanent condition of the bridge but not including fracture critical components nor secondary components.

**Snug Tight**: bolt tightness obtained by the full effort of a person using a spud wrench. A similar tightness may also be achieved by applying a few impacts using an impact wrench.

2.2 Related Specifications

- Specifications for Erection of Structural Steel
- Specifications for Coating Structural Steel

3.0 SUBMITTALS

The Contractor shall submit the following to the Engineer for approval prior to commencing fabrication in accordance with the Special Provisions:

.1 Design calculations and Shop Drawings for all structural steel components. These design calculations and Shop Drawings shall be stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba. Shop Drawings submitted for review shall include:

a) Full detail dimensions and sizes of all component parts of the structure. Components shall be detailed to compensate for changes in shape due to weld shrinkage, camber, and any other effects that cause finished dimensions to differ from initial dimensions;

b) Erection marks to uniquely identify all fabricated components;

c) All necessary specifications for the materials to be used;

d) Identification of areas requiring special surface treatment;

e) Identification of fracture-critical and primary tension members and component parts. Attachments having a length of more than 100 mm in the direction of tension and welded to the tension zone of a fracture-critical or primary tension member shall be treated as part of that member;

f) Bolt installation requirements, including number of fitting up bolts and drift pins required at each connection and oversize and slotted holes;

g) Details of all welds;

h) Identification of material and welds requiring non-destructive testing, including the limits of the weld to be tested and the frequency and type of testing;

i) Temporary welds; and

j) Location of shop and field welded and bolted splices.
.2 An Erection Diagram that is stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba and includes at least the following:

a) Principal dimensions of the bridge;
b) Erection marks;
c) Sizes of all members;
d) Field welding requirements, including identification of welds requiring non-destructive testing;
e) Size and type of bolts;
f) Bolt installation requirements, including the number of fitting up bolts and drift pins required at each connection and identification of oversize and slotted holes;
g) Bracing and all other temporary works required for erection of structural steel; and
h) Treatment at faying surfaces for joints designed as slip critical.

.3 Proposed welding procedures conforming to AWS D1.5 or CAN/CSA W59 and CAN/CSA W47.1 to be used in fabricating the various components. The following shall be included in the submitted welding procedures:

a) The welding process, position of weld, filler metal, flux, shielding gas if required, joint configurations, number and size of passes, preheat and inter-pass temperatures if required, sequence of passes, current, rate of pass, electrode size, electrical stick-out and polarity;
b) Methods proposed for edge preparation;
c) Measures proposed to control distortion, shrinkage and residual stresses;
d) Proposed methods and sequence of assembly; and
e) Welding equipment to be used.

.4 Mill test certificates showing chemical analysis and physical tests of all structural steel shall be submitted to the Engineer for review prior to commencement of fabrication.

One copy of mill test certificates for all material to be used in the fabrication shall be available for review at the fabricating plant during fabrication. The mill test certificates shall clearly indicate that the material meets the requirements shown on the Drawings and described in this Specification.

If material cannot be identified by mill test certificates, coupons shall be taken and tested and these test certificates shall be made available.

Where mill test certificates originate from a mill outside Canada or the United States of America, the Contractor shall have the information on the mill test certificate verified by independent testing by a Canadian laboratory. This laboratory shall be certified by an organization accredited by the Standards Council of Canada to comply with the requirements of ISO/IEC 17025 for the specific tests or type of tests required by the material standard specified on the mill test certificate. The mill test certificates shall be stamped with the name of the Canadian laboratory and appropriate wording stating that the material is in conformance with the specified requirements. The stamp shall include the appropriate material specification number, testing date, and the signature of an authorized officer of the Canadian laboratory.

.5 Proof shall be submitted to the Engineer demonstrating that the bolts, nuts, and washers meet the chemical composition, mechanical properties, dimensions, workmanship, and head burst as required by ASTM A 325/A 325M, A 563/A 563M or F 436/F 436M. Verification of the
acceptability of assemblage of zinc coated bolts shall be provided with the bolts, nuts, and washers delivered to the job site shall also be submitted to the Engineer.

.6 For bolts supplied from a manufacturer outside Canada or the United States of America, the above information shall be independently verified by testing by a Canadian laboratory as outlined in the clause 3.4.

.7 Loading and transportation procedures for structural steel girders, including the proposed route and all traffic control procedures shall be stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba.

.8 Repair procedures, if required, for repair of fabricating defects or other damage to structural steel components.

4.0 MATERIALS

4.1 Structural Steel

Structural steel shall be new and of the grade and category specified on the Drawings and in this Specification and shall be according to CSA G40.20/G40.21.

ASTM A 588M may be substituted for CSA G40.20/G40.21 grade 350A steel. When the Charpy impact energy requirements are verified by the submission of test documentation, ASTM A 588M may be substituted for CSA G40.20/G40.21 grade 350AT steel.

Substitution of material for size and grade is not permitted unless approved in writing by the Engineer.

4.2 High Strength Bolts, Nuts and Washers

High strength bolts, nuts, and hardened washers shall be in accordance with ASTM A 325/A 325M, A 563/A 563M, and F 436/F 436M. The nuts, bolts, and washers shall be shipped together as an assembly.

High strength bolts, nuts, and washers for use with unpainted corrosion-resistant steel shall be Type 3. Bolts, nuts, and washers used with steel specified on the Drawings or in this Specification to be painted or to be galvanized, shall be Type 1 and shall be galvanized.

Galvanized fastener nuts shall be over-tapped by the minimum amount required for assembly and shall be lubricated with a lubricant containing a visible dye.

4.3 Shear Connectors

Shear connectors shall be of a headed stud type supplied according to CSA W59, Appendix H.

4.4 Welding Consumables

The selection, supply, and storage of electrodes for SMAW and fluxes for SAW shall be according to CSA W59 requirements. Only controlled hydrogen designation electrodes and low hydrogen wire consumables shall be used for the SMAW and flux-cored arc welding processes, respectively. Electrodes and fluxes shall be strictly stored and maintained as required by CSA W59, section 5.2.

The weld filler metal in fracture critical and primary tension members shall meet the Charpy V notch impact energy requirements of Table 6.
Weld metal used with corrosion resistant steels shall have similar corrosion resistance and colour to the base metal and shall be supplied according to CSA W59.

4.5 Replacement of Damaged Materials

All material supplied by the Fabricator that in the opinion of the Engineer has been damaged or otherwise rendered unusable by improper storage or handling by the Contractor shall be replaced by the Contractor at his expense.

5.0 CONSTRUCTION

5.1 Material Preparation

.1 Straightening Material

All steel shall be flat and straight according to the specified mill tolerances before commencement of fabrication. Material with sharp kinks or bends shall only be straightened with the approval of the Engineer. The Contractor shall submit written procedures for approval to the Engineer and shall not commence straightening work until he has received permission from the Engineer.

When straightening is approved, material may be straightened using mechanical means or by the application of controlled heating according to CSA W59.

Details of the method of straightening shall be according to CSA W59 and submitted to the Engineer two weeks prior to the Contractor arranging for inspection of the straightened material and non-destructive testing.

The Engineer shall be given one week notice to arrange for their inspections.

.2 Edge Preparation

Sheared edges of plates with a 16 mm thickness or greater and that carry calculated tension shall have 3 mm of edge material removed by planing, milling or grinding.

Oxygen cutting of structural steel shall be done by machine except hand-guided cutting will be allowed for copes, blocks and similar cuts where machine cutting is impractical. Re-entrant corners shall be ground smooth and shall have a fillet of the largest practical radius, but in no case shall the radius be less than 25 mm.

Plasma arc cutting shall only be done when approved in writing by the Engineer. All nitrogen plasma arc cut edges shall be ground back by 0.5 mm when welding will be carried out on these edges.

The quality of the cut edges and their repair shall be according to CSA W59. All cut edges that are not to be welded shall have a surface roughness not greater than 1000 as defined by CSA B95. Edges of all flanges shall be rounded to a 1.5 mm radius by grinding. In addition all edges of all members and plates exposed to view or weather in the finished assembly shall be rounded to a 1.5 mm radius by grinding.

All steel edges that will be painted whether resulting from rolling, cutting or, shearing operations shall be rounded to a 1.5 mm radius by grinding prior to blast cleaning.

The Brinell hardness of the edges of flanges plates for fracture critical or primary tension members shall not exceed 220. If the measured hardness exceeds 220, the edges shall be ground to remove the harder layer or annealed by means of a preheating torch.
.3 Direction of Rolling

Steel plate for main members shall be cut so that the primary direction of rolling is parallel to the direction of tensile or compressive stress.

.4 Bolt Holes

Hole Size

The nominal diameter of a hole other than oversize or slotted holes shall be 2 mm greater than the nominal bolt size with the exception of the following bolt and hole combinations:

i. either a 19 mm (3/4") or an M20 bolt in a 22 mm hole;  
ii. either a 22 mm (7/8") or an M22 bolt in a 24 mm hole; and  
iii. either a 25 mm (1") bolt or an M24 bolt in a 27 mm hole.

Unless otherwise approved by the Engineer, oversize or slotted holes shall only be used when specified on the Drawings or in the Special Provisions. Non-specified oversize or slotted holes will only be considered for use in bracing and diaphragms.

Oversize holes when permitted shall not be more than 4 mm greater than the nominal bolt size for bolts 22 mm or less in diameter; 6 mm greater than the nominal bolt size for bolts between 23 and 26 mm in diameter; and, 8 mm greater than the nominal bolt size for bolts 27 mm and greater in diameter.

Short slotted holes when permitted shall be 2 mm wider than the nominal bolt diameter and shall have a length not greater than the oversize hole diameters specified above plus 2 mm.

Long slotted holes when permitted shall be 2 mm wider than the nominal bolt diameter and shall be no longer than 2.5 times the nominal bolt diameter.

Punched Holes

Holes shall only be punched to finish size in material 16 mm or less in thickness.

The diameter of a hole punched to finish size shall not be more than 2 mm larger than the nominal diameter of the bolt unless oversize holes are approved.

The diameter of the die shall not exceed the diameter of the punch by more than 2 mm. Holes shall be clean cut without ragged or torn edges. Sharp edges shall be ground smooth without reducing the cross-section of the member. The slightly conical hole that results from this operation is acceptable.

Drilled Holes

Holes which are drilled to finished diameter shall be 2 mm larger than the nominal diameter of the bolt unless oversize or slotted holes have been specified. Holes to be drilled shall be accurately located by using suitable numerically-controlled drilling equipment, or by using a steel template carefully positioned and clamped to the steel. The dimensional accuracy of holes and locations prepared in this manner shall be such that like parts are exact duplicates and require no match marking.

The holes for any connection may be drilled to the required finished diameter when the connecting parts are assembled and clamped in position, in which case the parts shall be match-marked before disassembling.
Reamed Holes

Holes which are to be reamed to the specified finished diameter shall first be sub-drilled or sub-punched to 4 mm less than the finished hole diameter. The holes shall be reamed to 2 mm larger than the nominal diameter of the bolts with connecting parts assembled and securely held in place during reaming. The connecting parts shall be match-marked before disassembling. Reamed holes shall be truly cylindrical and perpendicular to the member. All burrs shall be removed without reducing the cross section of the member.

Tolerances

Center to Center – 12 m or less: +/- 1.0 mm
Center to Center – 12 to 18 m: +/- 1.5 mm
Center to Center – 18 to 24 m: +/- 2.5 mm
Center to Center – over 24 m: +/- 3.0 mm

Pins and Rollers

Pins and rollers shall be accurately turned to the dimensions and finish shown on the Drawings and shall be straight and free from flaws. Pins and rollers more than 175 mm in diameter shall be forged and annealed. Pins and rollers 175 mm or less in diameter may be either forged and annealed or may be made from cold finished carbon-steel shaft.

Holes for pins shall be bored to the diameter and to the finish specified on the Drawings or in the Special Provisions and at right angles to the axis of the member. The diameter of the pin hole shall not exceed that of the pin by more than 0.5 mm for pins 125 mm or less in diameter or by 0.75 mm for larger pins. Built up members shall be completely assembled prior to boring of pin holes.

.5 Bent Plates

General

Rolled steel plates to be bent shall be cut from the stock plates so that the bend line is at right angles to the direction of rolling except as otherwise approved for orthotropic decks.

Before bending, the edges of the plate within the bend region shall be rounded to a 3 mm radius by grinding in the region of the bend.

Cold Bending

Cold bending shall be carried out in such a manner that no cracking or tearing of the plate occurs. Minimum bend radii for various plate thicknesses (t), measured to the concave face of the metal shall be:

<table>
<thead>
<tr>
<th>t, mm</th>
<th>radius, mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>t ≤ 12</td>
<td>2 t</td>
</tr>
<tr>
<td>12 ≤ t ≤ 25</td>
<td>2-1/2 t</td>
</tr>
<tr>
<td>25 ≤ t ≤ 38</td>
<td>3 t</td>
</tr>
<tr>
<td>38 ≤ t ≤ 65</td>
<td>3-1/2 t</td>
</tr>
<tr>
<td>65 ≤ t ≤ 100</td>
<td>4 t</td>
</tr>
</tbody>
</table>
Hot Bending

Forming radii less than that permitted for cold bending shall be done by hot bending at a plate temperature not greater than 600°C. Accelerated cooling of a hot bent component will only be permitted when the temperature of the component is below 300°C. Only compressed air or water shall be used for accelerated cooling.

.6 Camber

Girders shall be cambered before heat-curving.

When rolled sections are heat cambered, the proposed method of heat cambering shall be submitted to the Engineer for review one week prior to cambering.

Plate girders shall have the required camber cut into the web with suitable allowance for camber loss due to cutting and welding. All Nelson studs shall be welded to the top flange in the required areas before fit-up and subsequent final welding to the web.

Steel box girders fabricated with webs in an upright position shall have the fabricated camber verified by subtracting ordinates for deflections for girder segments from the relaxed camber diagram ordinates.

The ends of cambered girders shall be trimmed to be vertical under full dead load.

.7 Faying Surfaces

All faying surfaces of weathering steel shall be cleaned by sand blasting in the shop.

Faying surfaces of steelwork to be painted shall receive one coat of inorganic zinc primer. The slip coefficient of the primer shall be submitted to the Engineer for approval.

.8 Marking

Each member shall carry a unique erection mark for identification.

Permanent marking shall be affixed in an area not exposed to view in the finished structure.

.9 Temporary Welds

Temporary welds shall not be used on fracture-critical and primary tension members.

Temporary welds shall not be used on flange material in compression unless approved by the Engineer.
.10 Stress Relief

**Flange Plate Heat Curving**

The required plan curvature of welded curved I girder flanges may be accomplished by heat curving provided that the flange plan radius is not less than 45,000 mm and also exceeds both:

\[
\frac{37 \cdot b_f \cdot h}{\psi \cdot w \cdot F_y} \text{ and } \frac{51700 \cdot b_f}{\psi \cdot F_y}
\]

where

- \( h \) = clear depth of web between flanges in millimetres
- \( w \) = thickness of web in millimetres
- \( F_y \) = the specified minimum yield stress of the web material in megapascals
- \( \psi \) = the ratio of the total cross-sectional area to that of both flanges
- \( b_f \) = width of widest flange in millimeters

5.2 Welded Fabrication

.1 Fabrication Company Certification

The company(ies) undertaking welded fabrication shall be certified according to CSA W47.1, Division 1 or Division 2.

.2 Assembly

Assembly shall be according to AWS D1.5 or CSA W59 and the following:

a) Bearing stiffeners shall be vertical under full dead load;

b) Intermediate stiffeners shall be either vertical or perpendicular to fabrication worklines; and

c) Longitudinal web stiffeners shall be cut 25 mm short of the transverse web stiffeners.

d) Tack welds of 75 mm or greater in length shall be incorporated into the final weld.

.3 Welding of Fracture-Critical and Primary Tension Members

Only welding consumables certified by the CWB to applicable CAN/CSA W48 or AWS A5 requirements shall be used which includes Charpy V-notch toughness meeting the requirements of Table 6.

In groove welds connecting two different grades of steel, the classification of consumables used, including CVN impact requirements, shall be that applicable to the grade having the lower ultimate tensile strength.

For groove welds in fracture critical and primary tension members using certified consumables where the CVN test temperature required by Table 6 is lower than the test temperature in the CAN/CSA W48 or AWS A5 classifications, or where the standards are not applicable, welding consumables shall be approved by the CWB and qualified using a verification test assembly to establish the impact properties of the weld metal.
a) Testing Procedures shall follow those of the relevant CAN/CSA W48 or AWS A5 standard except that only CVN tests are required and that welding shall be carried out using the preheat and the maximum heat input to be used in practice.

b) CVN results shall meet the requirements of Table 6.

c) Qualifications are required for each electrode diameter used and for the consumables supplied by each manufacturer.

d) The qualification is valid for consumables for all groove weld procedures of the same or lower heat input as that used in the qualification test.

For groove weld procedures in fracture critical and primary tension members of 700Q and 700QT material, consumables shall be qualified by welding procedure tests approved by the Canadian Welding Bureau.

a) Tests shall be conducted according to CAN/CSA W47.1 using 700Q or 700QT material for the base plate and shall include weld metal and heat affected zone CVN impact tests according to CAN/CSA W47.1 Appendix D.

b) Weld metal impact tests shall meet the requirements of Table 4 and HAZ impact tests shall meet the requirements of Tables 4 and 5 for the base plate as appropriate.

c) Only consumables supplied by the manufacturer supplying those qualified shall be permitted in fabrication.

d) The qualification is valid for consumables for all groove weld procedures of the same or lower heat input as that used in the qualification test.

When the welding consumables have not been previously certified by the CWB, consumables shall be qualified by welding procedure tests in accordance with the provision of clause 8.2.2.4 of CAN/CSA W47.1 and shall include CVN impact tests of the weld metal.

a) For steel other than 700Q or 700QT, CVN tests in the HAZ are not required.

b) Weld metal CVN properties shall be established by qualification tests in accordance with CAN/CSA W47.1 (including Appendix D) and shall meet the requirements of Table 6.

c) Only consumables supplied by the manufacturer supplying those qualified shall be permitted in fabrication.

d) Qualification shall be done for each lot or batch of consumables.

e) The qualification is valid for consumables for all groove weld procedures of the same or lower heat input as that used in the qualification test.

Tack welds shall not be used on fracture critical, primary tension members and flange material in compression, unless approved by the Engineer.

.4 Welding Repairs of Fracture-Critical and Primary Tension Members

General

Welding repairs shall be performed using any appropriate welding procedure approved by the CWB for the fabrication of fracture-critical members and primary tension members. All repair welding shall be subject to non-destructive testing.

All welding repair procedures shall be submitted to the Engineer at least 2 weeks prior to commencement of the work.
Non-Critical Repairs

Repairs that may be classified as non-critical are as follows:

a) The repair of welds because of rollover, undercut, or insufficient throat; those requiring excavation of defects including porosity, slag, and lack of fusion; the repair of arc strikes; and removal of tack welds not incorporated into a final weld;

b) Visually detected planar and laminar discontinuities as defined in CSA W59, Table 5-2 but not deeper than 25 mm, or half of the thickness of the edge of the cut plate, whichever is less; and such discontinuities shall not be within 300 mm of a tension groove weld. There shall also be no visible planar or laminar discontinuity on any prepared face of a tensioned groove joint prior to welding;

c) Gouges not more than 5 mm deep on otherwise satisfactory cut or rolled surfaces that may be repaired by machining or grinding without welding; and

d) Occasional gouges, that may be repaired by welding, exceeding 5 mm but not more than 10 mm in depth on edges not to be welded.

Work on non-critical repair shall not commence until the Engineer has verified that the repair is a non-critical repair and has given written approval to proceed. The repair of gouges not more than 5 mm on otherwise satisfactory cut or rolled surfaces that may be repaired by machining or grinding without welding does not require prior approval.

Critical Repairs

Repair procedures for more severe conditions than those described for non-critical repairs are considered critical and shall be individually approved by the Engineer before repair welding is begun.

Critical repairs include the following:

a) Repair of lamellar tearing, laminations, and cracks except those meeting the requirements of paragraph b) in the Non-Critical Repairs clause;

b) Repair of surface and internal defects in rolled products except those meeting the requirements of paragraph b) of the Non-Critical Repairs clause;

c) Dimensional corrections requiring weld removal and rewelding; and

d) Any correction by welding to compensate for a fabrication error such as improper cutting, punching, or incorrect assembly other than tack welded or temporary assemblies.

Repair Procedures

Repair procedures shall be submitted to the Engineer at least two weeks prior to commencement of repair work and shall include sketches or full size drawings as necessary to adequately describe the deficiency and the proposed method of repair.

Procedures for critical repairs shall also include the location of the discontinuity.

Repair procedures except for visually detected planar and laminar discontinuities described in paragraph b) in the Non-Critical Repairs clause, shall include the minimum following provisions. The steps shall be listed in the order to be performed.

a) Surfaces shall be cleaned and ground as necessary to aid visual and nondestructive tests to identify and quantify the discontinuities.
b) The discontinuity shall be drawn as it appears from visual inspection and nondestructive testing.

c) Arc-air gouging, shall be part of the approved welding procedure when required.

d) Magnetic particle inspection or another inspection method approved by the Engineer shall be used to determine whether the discontinuity was removed as planned.

e) All air carbon-arc gouged and oxygen-cut surfaces that form a boundary for a repair weld shall be ground to form a smooth bright surface. Oxygen gouging is not permitted.

f) All required run-off tabs and back-up bars shall be shown in detail.

g) Preheat and interpass temperature shall be according to Table 1. Preheat and interpass temperatures shall be maintained without interruption until the repair is completed.

Table 1: Preheat and Interpass Temperatures

<table>
<thead>
<tr>
<th>Thickness, t</th>
<th>Grade, CSA G40.21</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>260WT, 300WT, 350WT, 400WT, 480WT, 350AT, 400AT, 480AT</td>
</tr>
<tr>
<td>t ≤ 25 mm</td>
<td>65°C</td>
</tr>
<tr>
<td>25 &lt; t ≤ 40 mm</td>
<td>120°C</td>
</tr>
<tr>
<td>t &gt; 40 mm</td>
<td>175°C</td>
</tr>
</tbody>
</table>

NOTE: For grade 700QT steel, preheat and interpass temperature shall be in accordance with steel manufacturer’s recommendations.

h) The repair procedures shall make reference to the applicable welding procedure specification and the related data sheet. If both of these were approved by the CWB prior to fabrication, they need not be prequalified by test for the specific method of repair unless a change in essential variables has been made or unless otherwise required by the Engineer.

i) If the geometry of the repair joint or if the excavation is similar to the geometry of a prequalified joint preparation as defined in CSA W59, and permits good access to all portions of such joints or excavations during the proposed sequence of welding, the welding procedure shall not require prequalification by test unless required by the Engineer.

j) Peening shall be noted as part of the approved procedure when required and shall be completely described. Peening equipment shall not contaminate the joint.

k) Post-heat shall be employed and shall continue without interruption from the completion of repair welding to the end of the minimum specified post-heat period. Post-heat of the repair area shall be between 200°C and 260°C and shall be for a period of one hour minimum for each 25 mm of weld thickness or for two hours, whichever is less.

l) Faces of repairs shall be ground flush with the plate or blended to the same contour and throat dimension as the remaining sound weld.

m) If stress-relief heat treatment is required, it shall be completely described. Final acceptance by nondestructive testing shall be performed after stress relief is complete.
n) Repairs of groove welds in fracture critical members shall be examined by ultrasonic testing (UT) and radiographic testing (RT). Repairs to groove welds in primary tension members shall be examined by UT or RT. Fillet weld repairs shall be examined by magnetic particle testing (MT). MT, RT, and UT shall be according to CSA W59. RT may be performed as soon as the weld has cooled to ambient temperature; however, final acceptance by MT and UT methods shall not be performed until the steel welds have been cooled to ambient temperature for at least the elapsed time indicated in Table 2.

<table>
<thead>
<tr>
<th>Plate Thickness</th>
<th>Magnetic Particle for Fillet Weld</th>
<th>Ultrasonic Examination of Groove Welds</th>
</tr>
</thead>
<tbody>
<tr>
<td>t ≤ 50 mm</td>
<td>24 hours</td>
<td>24 hours</td>
</tr>
<tr>
<td>t &gt; 50 mm</td>
<td>24 hours</td>
<td>48 hours</td>
</tr>
</tbody>
</table>

All repair welding and nondestructive testing shall be performed as described in the approved repair procedure.

All repair procedures for repairs requiring approval shall be retained as part of the project records.

5.5 Heat Curving Members

Steel beams, welded girders and all other structural steel members with a specified minimum yield point greater than 350 MPa shall not be heat curved.

In heat curving, using either the continuous or V-type heating pattern, the temperature of the steel shall not exceed 600°C.

A detailed procedure for the heat curving operation shall be submitted for review to the Engineer. The procedure shall describe the type of heating to be employed, the extent of the heating patterns, the sequence of operations, and the method of support of the girder, including an assessment of any dead-load stresses present during the operation.

Transverse web stiffeners may be welded in place either before or after the heat-curving operation; however, unless allowance is made for the longitudinal shrinkage, the bracing connection plates and bearing stiffeners shall be located and welded after curving.

5.3 Bolted Construction

.1 General

ASTM A 325/A 325M high strength bolts shall be used for bolted connections. Bolts shall be sufficiently long to exclude threads from the shear plane.

.2 Assembly

The assembly of joints shall be according to CAN/CSA S16 except that Turn-of-Nut tightening method shall be the only installation method used.

Prior to assembly, all joint surfaces, including those adjacent to bolt heads, nuts and washers, shall be free of loose scale, burrs, dirt, and foreign material.

The faying surfaces of connections identified as slip-critical connections shall be prepared as
specified below.

a) For clean mill scale, the surfaces shall be free of oil, paint, lacquer, or any other coating and then blast cleaned.

b) For coated surfaces other than galvanized, the surfaces shall be free of oil, lacquer, or other deleterious coatings.

c) Hot dip galvanized surfaces shall be roughened after galvanizing by means of hand wire brushing. Power wire brushing is not permitted.

This treatment shall apply to all areas within the bolt pattern and for a distance beyond the edge of the bolt hole that is the greater of 25 mm or the bolt diameter.

.3 Bolt Tension

Pretensioned bolts shall be tightened to at least 70% of the specified minimum tensile strength given in the appropriate ASTM standard.

.4 Reuse of Bolts

Bolts shall not be reused once they have been fully tightened. Bolts that have not been fully tensioned may be reused up to two times, providing that proper control on the number of reuses can be established. Retightening of bolts loosened due to the tightening of adjacent bolts is not considered to be a reuse.

.5 Hardened Washers

Hardened washers shall be provided under the head and the nut of each bolt for a total of two (2) washers per bolt.

Hardened washers are required under the nut and bolt head adjacent to joint surfaces containing oversize or slotted holes.

When used with slotted holes the washers shall be at least 8 mm thick and of sufficient size to overlap the hole by 5 mm all around.

.6 Bevelled Washers

Bevelled washers shall be used to compensate for lack of parallelism where an outer face of bolted parts deviates by more than 5% from a plane normal to the bolt axis.

.7 Turn-of-Nut Tightening

After aligning the holes in a joint with a properly sized drift pin, sufficient bolts shall be placed and brought to a snug-tight condition to ensure that the parts of the joint are brought into full contact with each other.

Following the initial snugging operation, bolts shall be placed in any remaining open holes and brought to snug-tightness. Resnuggling may be necessary in large joints.

When all bolts are snug-tight, each bolt in the joint shall be tightened additionally by the applicable amount of relative rotation given in Table 3, with tightening progressing systematically from the most rigid part of the joint to its free edges. During this operation there shall be no rotation of the part not turned by the wrench. The bolt and nut shall be matched marked to enable the amount of relative rotation to be determined.
### Table 3: Nut Rotation From Snug-Tight Condition

<table>
<thead>
<tr>
<th>Outer Face Alignment of Bolted Parts</th>
<th>Bolt Length $\frac{L_b}{d_b}$</th>
<th>Turn From Snug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both faces normal to bolt axis or, one face normal other face sloped 1:20 max – bevelled washers not used.</td>
<td>$L_b \leq 4 \ d_b$</td>
<td>1/3</td>
</tr>
<tr>
<td></td>
<td>$4 \ d_b &lt; L_b \leq 8 \ d_b$</td>
<td>1/2</td>
</tr>
<tr>
<td></td>
<td>$L_b &gt; 8 \ d_b$</td>
<td>2/3</td>
</tr>
<tr>
<td>Both faces sloped 1:20 from normal bolt axis – bevelled washers not used.</td>
<td>All Bolt Lengths</td>
<td>3/4</td>
</tr>
</tbody>
</table>

**NOTES:**
1. Bolt diameter is indicated as $d_b$
2. Tolerance on rotation is 30 degrees over/under.
3. Table applies to coarse-thread. Heavy-hex structural bolts of all sizes and lengths used with heavy-hex semi finished nuts.
4. Bolt length is measured from the underside of the head to the extreme end point.
5. Bevelled washers shall be provided when A490 or A490M bolts are used.

### .8 Shop Trial Assembly

Girders and other main components shall be preassembled in the shop to prepare or verify the field splices.

Components shall be supported in a manner consistent with the final geometry of the bridge as specified in the Drawings, with allowance for any camber required to offset the effects of dead-load deflection.

Holes in the webs and flanges of main components shall be reamed or drilled to finished diameter while in assembly. The components shall be drift pinned and firmly drawn together by a sufficient number of bolts before reaming or drilling.

Drifting done during assembly shall only be sufficient to align the holes and not to distort the steel. If holes are required to be enlarged they shall be reamed.

Where a number of sequential assemblies are required because of the length of the bridge, the second and subsequent assemblies shall include at least one section from the preceding assembly to provide continuity of alignment and distances for bearings.

Trial assemblies shall be made in the shop for all girder field-splices except as noted for holes drilled using numerically controlled machines. Each assembly shall be checked for camber, alignment, accuracy of holes, and fit-up of welded joints and milled surfaces.

### .9 Numerically Controlled Drilling

As an alternative to the above shop trial assembly, when the bolt holes have been prepared by numerically controlled machines, the accuracy of the drilling may be demonstrated by a check assembly consisting of the first components of each type to be made. If the check assembly is satisfactory, further assemblies of like components are not required. If the check assembly is unsatisfactory for any reason, the work shall be redone or repaired in a manner acceptable to the Engineer. Further check assemblies shall be required as specified by the Engineer to demonstrate that the required accuracy of fit up has been achieved.
.10 Match Marking

Connecting parts that are assembled in the shop for the purpose of reaming or drilling holes shall be match-marked. A drawing shall be prepared for field use detailing how the marked pieces shall be assembled in the field to replicate the shop assembly.

5.4 Fracture Control

.1 General

The provisions of this clause shall apply to members designated as fracture critical and primary tension members as identified on the Drawings or in the Special Provisions. The Fracture Control requirements shall apply to both bolted and welded construction.

.2 Identification

Shop Drawings shall identify the extent of fracture critical and primary tension members.

Attachments having a length of more than 100 mm in the direction of tension and welded to the tension zone of a fracture critical or primary tension member shall be treated as part of that member.

Records shall be kept for each component of a fracture critical or primary tension member to identify the heat number of the material and its corresponding mill test certificate.

.3 Fracture Toughness Requirements

The Charpy V-notch requirements given in Tables 4, 5 and 6 are for standard full-size specimens.

Fracture Critical Members

For fracture critical members, Charpy V-notch tests shall be specified on a per plate frequency and the steel shall meet the impact requirements given in Table 4.
Table 4: Fracture Critical Member Charpy V-Notch Impact Requirements

<table>
<thead>
<tr>
<th>Grade G40.21</th>
<th>Minimum Average Energy</th>
<th>Test Temperature Tt for Minimum Service Temperature Ts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Ts ≥ -30°C</td>
</tr>
<tr>
<td><strong>Commonly used steels</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>260WT</td>
<td>34 J</td>
<td>0°C</td>
</tr>
<tr>
<td>300WT</td>
<td>34 J</td>
<td>0°C</td>
</tr>
<tr>
<td>350WT</td>
<td>40 J</td>
<td>0°C</td>
</tr>
<tr>
<td>400WT</td>
<td>40 J</td>
<td>0°C</td>
</tr>
<tr>
<td><strong>Steels used only with prior MIT approval</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>350AT</td>
<td>40 J</td>
<td>0°C</td>
</tr>
<tr>
<td>400AT</td>
<td>40 J</td>
<td>0°C</td>
</tr>
<tr>
<td>480WT and AT</td>
<td>40 J</td>
<td>-10°C</td>
</tr>
<tr>
<td>700QT</td>
<td>50 J</td>
<td>-20°C</td>
</tr>
</tbody>
</table>

Primary Tension Members

For primary tension members, Charpy V-notch tests shall be specified on a per heat frequency and the steel shall meet the impact requirements given in Table 5.

Table 5: Primary Tension Member Charpy V-Notch Impact Requirements

<table>
<thead>
<tr>
<th>Grade G40.21</th>
<th>Minimum Average Energy</th>
<th>Test Temperature Tt for Minimum Service Temperature Ts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Ts ≥ -30°C</td>
</tr>
<tr>
<td><strong>Commonly used steels</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>260WT</td>
<td>20 J</td>
<td>0°C</td>
</tr>
<tr>
<td>300WT</td>
<td>20 J</td>
<td>0°C</td>
</tr>
<tr>
<td>350WT</td>
<td>27 J</td>
<td>0°C</td>
</tr>
<tr>
<td>400WT</td>
<td>27 J</td>
<td>0°C</td>
</tr>
<tr>
<td><strong>Steels used only with prior MIT approval</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>350AT</td>
<td>27 J</td>
<td>0°C</td>
</tr>
<tr>
<td>400AT</td>
<td>27 J</td>
<td>0°C</td>
</tr>
<tr>
<td>480WT and AT</td>
<td>27 J</td>
<td>-10°C</td>
</tr>
<tr>
<td>700QT</td>
<td>34 J</td>
<td>-20°C</td>
</tr>
</tbody>
</table>
Service Temperature

The applicable minimum service temperature shall be the minimum daily mean temperature taken from "Canadian Climate Normals" published by Environment Canada.

Permanent Backing Bars

Permanent backing bars shall not be used unless absolutely necessary and approved for use in writing by the Engineer. Steel for permanent backing bars shall meet the requirements of clause 5.5.1.1 of CAN/CSA W59 or equivalent under AWS D1.5 and in addition, shall meet the CVN requirement of Tables 4 and 5 as appropriate.

Weld Metal Toughness

For fracture critical and primary tension members, the weld metal shall meet the impact requirements of Table 6.

Table 6: Weld Metal Charpy V-Notch Impact Requirements

<table>
<thead>
<tr>
<th>Grade G40.21</th>
<th>Test Temperature Tt for Minimum Service Temperature Ts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Average Energy</td>
<td>Ts ≥ -40°C</td>
</tr>
<tr>
<td>260 WT</td>
<td>20 J</td>
</tr>
<tr>
<td>300 WT</td>
<td>20 J</td>
</tr>
<tr>
<td>350 WT and AT</td>
<td>27 J</td>
</tr>
<tr>
<td>400 WT and AT</td>
<td>27 J</td>
</tr>
<tr>
<td>480 WT and AT</td>
<td>27 J</td>
</tr>
<tr>
<td>700 QT</td>
<td>40 J</td>
</tr>
</tbody>
</table>

5.5 Fabrication Tolerances

1. Structural Members

Structural members consisting of a single rolled shape shall meet the straightness tolerances of CAN/CSA G40.20 except that columns shall not deviate from straight by more than 1/1000 of the length between points of lateral support.

A variation of 1 mm from the detailed length adjusted for temperature is permissible in the length of members which have both ends finished for contact bearing.

Members without finished ends may have a variation from the detailed length of not more than 2 mm for members 10 meters long or less, not more than 4 mm for members over 20 meters in length. The variation for members between 10 and 20 m in length shall be linearly interpolated.
.2 Abutting Joints

Where compression members are specified to bear against one another, the completed joint shall have at least 75% of the entire contact area in full bearing, defined as an area with no more than 0.5 mm of separation. The separation of the remaining area shall in no case and at no point exceed 1 mm.

At joints where loads are not transferred in bearing, the nominal dimension of the gap between main members shall not exceed 10 mm unless indicated otherwise on the Drawings.

.3 Bearing Plates

Rolled steel bearing plates 50 mm or less in thickness may be used without planing provided that a satisfactory contact bearing is obtained.

Rolled steel bearing plates over 50 mm but less than 100 mm in thickness may be straightened by pressing or by planing the entire bearing surface to obtain a satisfactory contact bearing.

Rolled steel bearing plates over 100 mm in thickness shall be planed on all bearing surfaces except for surfaces which are in contact with concrete or grouted to ensure full bearing.

.4 Bearing Surface Finish

The surface finish of bearing surfaces that are in contact with each other or with concrete, shall meet the following roughness requirements as measured according to ANSI B46.1.

<table>
<thead>
<tr>
<th>Surface Type</th>
<th>Roughness Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel slabs or plates in contact with concrete</td>
<td>50 μm (2000 Micro inches)</td>
</tr>
<tr>
<td>Plates in contact as part of bearing assemblies</td>
<td>25 μm (1000 Micro inches)</td>
</tr>
<tr>
<td>Milled ends of compression members</td>
<td>12 μm (500 Micro inches)</td>
</tr>
<tr>
<td>Milled or ground ends of stiffeners</td>
<td>12 μm (500 Micro inches)</td>
</tr>
<tr>
<td>Bridge rollers or rockers</td>
<td>6 μm (250 Micro inches)</td>
</tr>
<tr>
<td>Pins and pin holes</td>
<td>3 μm (125 Micro inches)</td>
</tr>
<tr>
<td>Sliding bearings: steel and copper alloy or steel and stainless steel</td>
<td>3 μm (125 Micro inches)</td>
</tr>
</tbody>
</table>

Surfaces of flanges that are in contact with bearing sole plates shall be flat within 0.5 mm over an area equal to the projected area of the bearing stiffeners and web. Outside this area a 2 mm deviation from flat is acceptable. The bearing surface shall be perpendicular to the web and bearing stiffeners.

.5 Fabricated Components

Tolerances for welded components shall conform to Clause 5.4 of CAN/CSA W59.

Dimensional tolerances for welded built-up structural members shall conform to those prescribed by Clauses 5.8 and 12.5.3 of CAN/CSA W59.

Built-up bolted structural members shall satisfy the straightness tolerances for rolled wide flange shapes prescribed by CAN/CSA G40.29.

Bearing stiffeners fitted to bear shall have a minimum bearing contact area of 75% with a maximum separation not exceeding 1 mm over the remaining area.
Fitted intermediate stiffeners shall have a minimum bearing contact area of 25% and a maximum separation of 2 mm over the remaining area.

5.6 Handling, Storage and Loading

Structural steel, either plain or fabricated, shall be stored upright above ground in a shored position on platforms, skids or other similar supports and shall be kept free from dirt and other foreign matter.

Structural material, either plain or fabricated, shall be protected from corrosion.

Long members shall be so supported as to prevent deflection.

Structural Steel Girders

The lifting devices shall be of such a nature as to avoid twisting, racking, or other distortions while handling, storing, moving and erecting the girders. The devices shown on the Drawings are minimum requirements and the Contractor and the Fabricator shall satisfy themselves as to the adequacy of the devices. The girders shall be picked up only by the lifting devices.

The Fabricator shall be responsible for storage of the girders from the completion of their fabrication until they are required by the Contractor.

During storage and hauling, the girders shall be maintained in an upright position and shall be supported at the bearing areas only unless otherwise approved in writing by the Engineer. Extreme care shall be exercised during the handling and storage of the structural steel girders to avoid twisting, deflection or other distortion that may result in damage to the girder.

5.7 Transportation and Delivery

The structural steel fabricator shall schedule, coordinate and sequence structural steel transportation and delivery in cooperation with the erection of the structural steel by the structural steel erection contractor.

The Contractor shall perform all work necessary to ensure safe loading, transportation, unloading and storage of structural steel. The Work shall consist of loading the structural steel at the Fabricator’s plant, transporting the structural steel to the site, and unloading and storing the structural steel at the site, including temporary works for access.

Structural steel shall be loaded for shipping in such a manner that it can be transported and unloaded at its destination in the correct orientation for erection without being excessively stressed, deformed, or otherwise damaged.

Structural steel shall be stockpiled to avoid excessive stress deformation or other damage while stored.

The transportation plan and schedule shall be provided to the Engineer not less than 7 Days before any shipping begins.

Structural Steel Girders

When transporting bridge girders, the Contractor shall be responsible for ensuring that all of the required permits have been acquired and the conditions of all permits are met.

The Contractor shall submit his proposed route for transporting the girders including traffic control procedures as part of the proposed loading and transporting procedure. In all traffic control
situations, the flagmen must be trained and properly attired in flagman's vest and approved headgear with approved flagman's stop/slow paddle or fluorescent red flag. The proper advance signing must also be in place.

No loose timber blocking will be permitted for use as temporary works for any aspect of girder handling, storage and transportation. Plate girders shall be transported with their webs in a vertical plane unless otherwise approved by the Engineer.

It is the Contractor's responsibility to ascertain the actual weight of the girders.

6.0 QUALITY MANAGEMENT

6.1 Quality Control

.1 Non-Destructive Testing Agency

The Contractor shall engage an independent testing organization certified by the Canadian Welding Bureau (CWB) to the requirements of CSA W178.1 for bridge structures by radiographic, ultrasonic, magnetic particle, and liquid penetrant test methods to perform all non-destructive testing of the welds.

All visual inspection of welds shall be performed in accordance with CSA W59 by a welding inspector certified by the CWB to the requirements of CSA 178.2 (Level II minimum) for bridges and structures.

Non-destructive testing shall be done by a non-destructive testing technician certified to the Canadian General Standards Board (CGSB) in the test method specified and being performed by the Inspector.

Neither the technician nor the independent testing organization shall be changed without the approval of the Engineer.

.2 Non-Destructive Testing of Welds

Radiographic, ultrasonic, or magnetic particle testing shall be completed by the Contractor using procedures and frequency of testing according to CSA W59 however, notwithstanding the CSA W59 requirements, the amount and location of welding to be tested shall be at least:

a) All welds shall be visually inspected.

b) The frequency of radiographic or ultrasonic inspection of groove welds in flanges and webs of built-up girders shall be:

i. Flange splices in tension or stress reversal zones: 100% of all welds.

ii. Flange splices in compression zones: 100% of the weld of 1 in 4 splices.

iii. Web splices for 1/2 the depth from the tension flange: 100% of the weld length for each weld.

iv. Web splices for 1/2 the depth from the compression flange: 100% of the weld length of 1 in 4 splices.

If defects are found during testing, two additional splices shall be tested for each splice exhibiting defects.
c) Magnetic particle inspection of web-to-flange fillet welds:
   i. Submerged-arc welds: 25% of length of each weld.
   ii. Semi-automatic welds: 50% of length of each weld.
   iii. Manual welds: 100% of length of each weld.

d) Magnetic particle inspection of fillet welds in connection plates and stiffeners to which diaphragms or cross bracing are attached:
   i. For 1/2 the depth from the tension flange: 100% of weld length of each weld.
   ii. Transverse welds on tension flanges: 100% of weld length of each weld.

e) Arc strikes outside of the completed welds shall be lightly ground and checked for cracks by Magnetic Particle Inspection.

Radiographic and ultrasonic testing shall be performed prior to the assembly of the flanges to the webs after splice welds have cooled as per CSA W59.

6.2 Quality Assurance

Visual inspection and sampling will be done in the fabricating shop and in the field by the Engineer to confirm the material supplied and the fabrication has been done as specified on the Drawings, in this Specification and in the Special Provisions. The Contractor shall supply material specimens for testing when requested by the Engineer.

The Contractor shall provide full facilities for the unencumbered inspection of material, workmanship and all parts of the work at all stages of the work by the Engineer in the shop, in storage facilities and in the field. The Engineer shall be allowed free access to the work.

The Engineer will perform non-destructive testing of the works, destructive testing of samples obtained of materials to be incorporated into the work and any other additional inspection at his discretion.

6.3 Inspection Requirements for Fabrication Outside of the Province of Manitoba

Should all or any part of the structural steel fabrication be undertaken at a facility outside of the Province of Manitoba, expenses incurred by the Department and/or the Department’s representative to carry out audit testing will be deducted as incurred by the Department from payments made to the Contractor. Expenses will include, but are not limited to all travel, boarding, lodging and the retention of services from a CWB certified inspection agency of the Department’s choice for audit inspections at the fabrication plant of all related works.

7.0 METHOD OF MEASUREMENT

7.1 Supply and Fabrication of Structural Steel

The structural steel will be measured on a mass basis. The total mass to be paid for will be computed on the basis of the net finished dimensions on the plans, deducting the mass of copes, cuts, clips and all open holes, except bolt holes. The mass of rolled shapes will be calculated using the nominal mass listed in recognized handbooks or as follows:
<table>
<thead>
<tr>
<th>Material</th>
<th>Unit Mass (kg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Steel</td>
<td>7 850</td>
</tr>
<tr>
<td>Lead</td>
<td>11 320</td>
</tr>
<tr>
<td>Bronze</td>
<td>8 590</td>
</tr>
</tbody>
</table>

The mass of all paint, galvanizing material or other protective coatings, and all deposited weld metal used for either shop or field welding, will not be included in the mass of material to be paid for.

7.2 Delivery of Structural Steel

Delivery of structural steel will be paid for on a Lump Sum basis and no separate measurement will be taken for this work.

8.0 BASIS OF PAYMENT

8.1 Supply and Fabrication of Structural Steel

Supply and fabrication of structural steel will be paid for at the Contract Unit Price per kilogram for “Supply and Fabricate Structural Steel” measured as specified herein, which price will be payment in full for performing all operations herein described and all other items incidental to the Work.

8.2 Delivery of Structural Steel

Delivery of structural steel will be paid for at the Contract Lump Sum Price for “Delivery of Structural Steel, measured as specified herein, which price will be payment for performing all operations herein described and all other items incidental to the Work.”