



LAKE LOUISE CAMPGROUND BRIDGE REHABILITATION

Lake Louise, Alberta

Project No.: 113678159

Issued for Tender
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PROJECT MANUAL

Issued by



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END OF SECTION

PART 1 GENERAL

1.1 Work Covered by Contract Documents

- .1 Work of this Tender Package comprises of rehabilitating two vehicle bridge structures that cross the Bow River, located at Lake Louise Campground, Banff National Park, Alberta.
- .2 Work specified in this Tender Package is divided into Divisions and Sections for reference purposes only. Except, as may be otherwise specified in the Contract Documents, division of work among Contractor, Subcontractors, Sub-subcontractors, and Suppliers is the Bidders' responsibility.
- .3 Preparation of an Environmental Protection Plan (EPP) for the work.
 - .1 An "EPP" is to be prepared and followed by the successful Contractor to meet the requirements of Section 01 35 43 – Environmental Procedures, to ensure that any adverse effects are minimal. The Contractor's EPP must be approved by the Departmental Representative on behalf of Parks Canada prior to the commencement of construction. The Departmental Representative and Parks Canada's Environmental Surveillance Officer (ESO) will refer to the approved EPP in determining compliance with the plan and Contract specifications. The EPP will form part of this Contract.
- .4 All requirements noted within the Contract Documents shall be completed by the Contractor unless specifically stated otherwise.
- .5 Without limiting the scope of work as defined by the Contract Documents in their entirety, the Work of this Contract generally comprises the following:
 - .1 Partial depth concrete repair,
 - .2 Application of concrete sealant to exposed concrete surfaces,
 - .3 Repaving the bridge decks using Asphalt Concrete Pavement (ACP),
 - .4 Repaving the approaches using ACP
 - .5 Expansion joint replacement,
 - .6 Repairs to the pathways,
 - .7 Concrete crack repair,
 - .8 Provide permanent traffic signage.

1.2 Contract Method

- .1 Construct work under a unit price contract.

1.3 Work Schedule

- .1 Complete work of this project by October 31, 2019.

1.4 Contractor Use of Premises

- .1 Limit use of premises for work, for storage, and for access to allow:
 - .1 Public usage of the tent campground, not included in this scope of work, will remain open. Fairview Road will remain open as an access to open tent sites and other facilities.

- .2 Coordinate use of premises under direction of the Departmental Representative.
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this contract.
- .4 Remove or alter existing work to prevent injury or damage to portions of existing work that remain.
- .5 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by the Departmental Representative.
- .6 Conditions of existing work at completion of operations: equal to or better than that which existed before new work started.

1.5 Traffic Management

- .1 The Contractor is required to prepare a Traffic Management Plan and submit for review by Department Representative before mobilizing to the work site.
- .2 Pedestrian, bicycle, and vehicular access to the tent campground shall be maintained during the duration of work.
- .3 Provide for pedestrian, bicycle, vehicular, and wildlife traffic through the work areas for the duration of construction.
- .4 Provide alternative routes for personnel, pedestrian, and vehicular traffic, as required to complete the work.

1.6 Construction Signage

- .1 No signs of advertisements, other than warning signs, are permitted on-site.
- .2 Signs and notices for safety and instruction shall be in both official languages. Signs shall be diamond grade and shall conform to CAN3-Z321.
- .3 Maintain approved signs and notices in good condition for the duration of the project and dispose off-site at completion of the project or earlier, if directed by the Departmental Representative.
- .4 All temporary traffic control signs that are used for longer than one day shall be mounted on wood posts.
- .5 Signage shall be coordinated with other Contractors.

1.7 Contractor Accommodations

- .1 Contractors are permitted to camp within Lake Louise Campground subject to availability.
- .2 Regular fees will be charged for any camping as per regular rates for respective services provided. Information is available online at <https://www.pc.gc.ca/en/pn-np/ab/banff/activ/camping/lltrailer>.
- .3 Contractors are subject to all regular camping restrictions found here: <https://www.pc.gc.ca/en/pn-np/ab/banff/activ/camping/rules-regles>.

1.8 Documents Required

- .1 Maintain at the work site, a copy of each document as follows:
 - .1 EPP.

- .2 Contract Drawings.
- .3 Specifications.
- .4 Addenda.
- .5 Reviewed Shop Drawings.
- .6 List of Outstanding Shop Drawings.
- .7 Change Orders.
- .8 Other Modifications to Contract.
- .9 Field Test Reports.
- .10 Permits.
- .11 Copy of Approved Work Schedule.
- .12 Health and Safety Plan and Other Safety Related Documents.
- .13 Other documents as specified.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Access and Egress

- .1 Design, construct, and maintain temporary "access to" and "egress from" work areas including stairs, ramps or ladders, and scaffolding independent of finished surfaces and in accordance with relevant municipal, provincial, and other regulations.
- .2 Vehicular and pedestrian access to the tent campground from Fairview Road shall be maintained throughout the entirety of the project.

1.2 Use of Site and Facilities

- .1 Execute work with the least possible interference or disturbance to the public and normal use of the premises. Make arrangements with the Departmental Representative to facilitate work as stated.
- .2 Maintain existing services to the work site and provide for personnel and vehicle access.
- .3 Where security is reduced by work, provide temporary means to maintain security.
- .4 Use of work site sanitary facilities is permitted; however, keep facilities clean.

1.3 Hours of Work

- .1 Work is permitted during daylight hours from 08:00 to 18:00, Monday to Saturday unless indicated otherwise.
- .2 No work will be permitted on Sundays unless prior written approval is granted by the Consultant.
- .3 Work will not be permitted during an Statutory Holiday long weekend, including one day prior to and one day following.
- .4 Work will not be permitted during the following Civic Holidays or long weekends unless prior written approval is granted by the Consultant:
 - .1 Statutory and Civic Holidays (2019):
 - .1 Good Friday weekend: From 18:00 Thursday, April 18, 2019 to 08:00 Tuesday, April 23, 2019.
 - .2 Victoria Day Weekend: From 18:00 Thursday May 16, 2019 to 08:00 Tuesday, May 21, 2019.
 - .3 Canada Day weekend: From 18:00 Thursday June 27, 2019 to 08:00 Tuesday, July 2, 2019.
 - .4 Heritage Day weekend: From 18:00 Thursday August 1, 2019 to 08:00 Tuesday August 6, 2019.
 - .5 Labour Day long weekend: From 18:00. Thursday, August 29, 2019 to 08:00 Tuesday, September 3, 2019.
 - .6 Thanksgiving Day weekend: From 18:00 Thursday, October 10, 2019 to 08:00 Tuesday, October 15, 2019.

- .5 Any variance that may be approved by the Consultant under this Section may be revoked at any time for any reason and is provided on the presumption that no additional costs or delays will result from the variance. No claims for additional costs, delays, schedule impacts, loss of productivity, or other extra work resulting from a variance will be entertained.

1.4 Waste Disposal

- .1 All surplus, unsuitable waste materials shall be removed from the work site to sites outside Banff National Park, unless specified otherwise in other Sections of this Tender Package.
- .2 All surplus, clean excavated earth waste materials, may be disposed of at Pit 69, located north of the Lake Louise Campground Overflow.
- .3 Deposits of any construction debris into any waterway are strictly forbidden unless specifically instructed to within the Contract Documents or by the Departmental Representative.
- .4 Cost for waste disposal described above shall be considered incidental to the work and no additional payment will be made.

1.5 Existing Services

- .1 Notify the Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where work involves breaking into or connecting to existing services, give the Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout the course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.
- .3 Provide alternative routes for pedestrian and vehicular traffic for all areas.
- .4 Establish location and extent of service lines in the area(s) before starting work. Notify the Departmental Representative of findings.
- .5 Submit schedule to, and obtain approval from, the Departmental Representative for any shut-down or closure of active service or facility, including power and communications services. Adhere to the approved schedule and provide notice to the affected parties.
 - .1 The Contractor shall not be permitted to sever the power to the existing shower facility on the tent side for extended durations. Where required, as a result of the work, provide temporary power by means of a generator or alternate connection to utility at existing voltage and amperage. The Contractor shall confirm with the Owner in writing the extent of any outage. Work shall not commence until approval is confirmed.
- .6 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .7 Where unknown services are encountered, immediately advise the Departmental Representative and confirm findings in writing.
- .8 Protect, relocate, or maintain existing active services. When inactive services are encountered, cap off in a manner approved by authorities having jurisdiction.
- .9 Record locations of maintained, re-routed and abandoned service lines.

1.6 Special Requirements

- .1 Ensure that Contractor personnel employed on-site become familiar with and obey regulations including safety, fire, traffic, and security regulations.
- .2 Keep within limits of work and avenues of ingress and egress.

1.7 Smoking Environment

- .1 Comply with smoking restrictions. Smoking areas, if permitted, shall be confirmed with the Owner.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Measurement for Payment

- .1 For each unit price item, the Departmental Representative will calculate payment based on tendered unit price and the Departmental Representative's determination of units of work item completed.
- .2 For lump sum price items, the Departmental Representative will calculate payment based on tendered price and the Departmental Representative's estimate of percentage of work completed.
- .3 Where a method of measurement for payment for a work item is not specified, payment for that item will be deemed to be included in another pay item or other pay items.
- .4 Unless otherwise noted, the Contractor is responsible for both supply and installation of materials under this Contract.

1.2 Measurement and Payment Clauses

.1 General

.1 Mobilization and Demobilization

- .1 This lump sum item to include all costs associated in administering the work; and mobilizing, maintaining, and demobilizing the site required to execute the work including:
 - .1 Specified insurance, equipment, operating overhead, mobilization and demobilization costs required to maintain the workforce on-site.
 - .2 Safe guarding the work sites including Prime Contractor responsibilities, safety program, temporary paths, temporary barriers, delineators, barricades, flashing lights, signage, and other measures required to protect the public from the work site and to provide access at intersecting streets.
 - .3 Care of water including protection of the work sites and completed construction area and adjacent areas outside of the limits of construction from water or runoff originating within, and/or adjacent to the limits of construction.
 - .4 Temporary material storage and handling.
 - .5 Stockpile and material conditioning sites including restoration.
 - .6 Notification of Alberta One-Call and other private sources necessary to obtain all underground utility locations.
 - .7 Protect and relocate existing utilities during construction.
 - .8 All regulatory and other approvals and permits required to execute the work.
 - .9 All submittals, including but not limited to environmental protection plan(s) (EPP), construction schedule and work plans.

- .10 All equipment, labour, and materials necessary to complete work outlined in reviewed EPP.
 - .11 Safe guarding of all surrounding infrastructure and repair or restoration of any damage caused by construction activities.
 - .12 All equipment labour and materials necessary to provide Security Fence around the work site.
 - .13 Provide on-site security and associated costs.
 - .2 The lump sum price shall be paid in stages and be based on the work completed. Fifty percent (50%) of the Tender amount for this item will be paid upon submittal and acceptance of the EPP and construction schedule. Twenty five percent (25%) will be paid based on the percentage of construction completion. The remaining twenty five percent (25%) will be paid following submission of record information and completion of all restoration and demobilization work. Mobilization will only be paid once, regardless of the number of times the Contractor mobilizes.
- .2 Traffic and Pedestrian Accommodation
 - .1 This lump sum item to include all costs associated with preparing, administering, maintaining, and implementing the Traffic and Pedestrian Accommodation Work in this Contract.
 - .2 The lump sum price shall be paid in stages and be based on the work completed. Twenty five percent (25%) of the Tender amount for this item will be paid upon submittal and acceptance of the Traffic and Pedestrian Accommodation Plan. Sixty five percent (65%) of the lump sum will be paid on a pro-rated basis based on the percentage of work complete. The remaining ten percent 10% will be paid when the Contractor has left the site in a condition acceptable to the Departmental Representative.
- .3 General Requirements
 - .1 This lump sum has been provided for the Contractor to include specified bonding and insurances, Quality Control, construction equipment, operating overhead, and all other Prime Contractor responsibilities.
 - .2 The lump sum price shall be paid based on the percent of the Contract work complete (in dollars).
- .2 Bridgeworks
 - .1 Asphalt Replacement
 - .1 The unit price shall include full compensation for the cost of furnishing all labour, materials, equipment, tools, and incidentals necessary to complete the work, including disposal of the debris, and supply and installation of new material. Work includes the bridge deck and the approach transitions. Measurement and Payment shall be measured in square metres.
 - .2 Waterproofing
 - .1 The unit price shall include full compensation for the cost of: the preparation of concrete surfaces, including sandblasting and/or shotblasting; the supply and application of the asphaltic primer;

the supply and installation of asphalt membrane, membrane reinforcing fabric, rubber membrane, wick drain, and protection board; including all labour, equipment, tools and incidentals necessary to complete the Work as shown on the Drawings and to the satisfaction of the Departmental Representative. All costs associated with waterproofing of vertical faces of curbs and barriers will be considered incidental to the Work, and no separate or additional payment will be made. The quantity to be paid for will be based on horizontal measurement of surface areas where waterproofing has been acceptably installed. Vertical faces will not be measured. Measurement and Payment shall be measured in square metres.

- .3 Deck Partial Depth\Full Depth Repair
 - .1 The unit price shall include full compensation for the containment and removal of concrete; abrasive blasting; disposal of debris; the supply and installation of additional reinforcing steel where required; epoxy-coated reinforcing steel coating repairs where required; provision and removal of all formwork, scaffolding and falsework; repair material supply, placement and testing; and all labour, materials, equipment, tools, and incidentals to complete the work. Measurement and Payment shall be measured in square metres.
- .4 Curb, Wingwalls and Sidewalk Partial Depth Repairs
 - .1 The unit price shall include full compensation for the containment and removal of concrete; abrasive blasting; disposal of debris; the supply and installation of additional reinforcing steel where required; epoxy-coated reinforcing steel coating repairs where required; provision and removal of all formwork, scaffolding and falsework; repair material supply, placement and testing; and all labour, materials, equipment, tools, and incidentals to complete the work. Measurement and Payment shall be measured in square metres.
- .5 Pier and Abutment Partial Depth Repairs
 - .1 The unit price shall include full compensation for the containment and removal of concrete; abrasive blasting; disposal of debris; the supply and installation of additional reinforcing steel where required; epoxy coated reinforcing steel coating repairs where required; provision and removal of all formwork, scaffolding and falsework; repair material supply, placement and testing; and all labour, materials, equipment, tools and incidentals to complete the Work. Measurement and Payment shall be measured in square metres.
- .6 Galvanic Anodes
 - .1 The unit price shall include full compensation for the cost of supply, placement, furnishing all labour, equipment, tools and incidentals necessary to complete the work. Measurement and Payment shall be measured per unit (i.e. anode).

- .7 Joint Replacement
 - .1 The unit price shall include full compensation for the cost of supply, placement, furnishing all labour, equipment, tools and incidentals necessary to complete the work. Measurement and Payment shall be measured in linear metres.
- .8 Crack Repairs
 - .1 The unit price shall include full compensation for the cost of supply, placement, furnishing all labour, equipment, tools and incidentals necessary to complete the work. Measurement and Payment shall be measured in linear metres.
- .9 Concrete Sealant
 - .1 The unit price shall include full compensation for the cost of supply, placement, furnishing all labour, equipment, tools, and incidentals necessary to complete the work. Measurement and Payment shall be measured in square metres.
- .10 Pathway Repair
 - .1 The unit price shall include full compensation for the cost of supply, placement, furnishing all labour, equipment, tools, and incidentals necessary to complete the work. Measurement and Payment shall be measured in square metres.
- .11 Permanent Traffic Signage
 - .1 The unit price shall include full compensation for the cost of supply, placement, furnishing all labour, equipment, tools, and incidentals necessary to complete the work. Measurement and Payment shall be measured per sign.

1.3 Quantities

- .1 Except as specified below, Bidders are responsible for confirming all quantities required to prepare a complete and accurate Tender Package.
- .2 Quantities shown in the table below cannot be confirmed by Bidders prior to Tender.
 - .1 For these items of work, Tenders shall be based on the estimated quantities shown below.
 - .2 Contract Price will be adjusted by change order to suit the actual quantities for these items using the unit pricing information provided.

Table of Quantities			
Item	Unit of Measurement	West River Bridge	East River Bridge
Asphalt replacement	Square Metres	424	402
Waterproofing	Square Metres	191	191
Deck partial depth concrete repairs	Square Metres	20	58
Curbs, wingwalls and sidewalk partial depth concrete repairs	Square Metres	4	4
Pier and abutments partial depth concrete repairs	Square Metres	6	5
Full Depth concrete repairs	Square Metres	2	1
Galvanic anodes	Units	148	285
Joint replacement	Metres	15.9	15.9
Pier crack repair	Linear Metres	0	6
Girder crack repair	Linear Metres	6	10
Concrete sealant	Square Metres	120	120
Pathway repairs	Square Metres	29	32
Permanent traffic signage	Units	2	2

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Administrative

- .1 The Departmental Representative will schedule and administer project meetings throughout the progress of the work.
- .2 The Departmental Representative will prepare agenda for meetings.
- .3 The Departmental Representative will distribute written notice of each meeting four days in advance of meeting date to Owner and Contractor.
- .4 The Contractor shall provide physical space and make arrangements for meetings.
- .5 The Departmental Representative will preside at meetings.
- .6 The Departmental Representative will record meeting minutes, including significant proceedings and decisions, and identify actions by parties.
- .7 The Departmental Representative will reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and affected parties not in attendance.
- .8 Representative(s) of the Contractor, Subcontractor, and Suppliers attending meetings will be qualified and authorized to act on behalf of the party each represents.

1.2 Preconstruction Meeting

- .1 Within ten days after award of Contract, the Departmental Representative will request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Representatives from Parks Canada, Contractor, major Subcontractors, and the Departmental Representative will be in attendance.
- .3 The Departmental Representative will establish time and location of meeting and notify parties concerned a minimum of five days before meeting.
- .4 Agenda to include:
 - .1 Appointment of official representative of participants in the work.
 - .2 Schedule of work in accordance with Division 01.
 - .3 Schedule of submission of shop drawings. Submittals will be submitted in accordance with Division 01.
 - .4 Requirements for temporary facilities, offices, storage sheds, utilities, fences.
 - .5 Health and safety requirements.
 - .6 Traffic Accommodation Plan.
 - .7 Environmental Protection Plan.
 - .8 Quality Management.
 - .9 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, administrative requirements.

1.3 Progress Meetings

- .1 During the course of work, progress meetings will be held every two weeks.
- .2 Contractors, major Subcontractors involved in the work, the Departmental Representative, and Owner are to be in attendance.
- .3 The Departmental Representative will notify parties a minimum of five days prior to meetings.
- .4 The Departmental Representative will record minutes of meetings and circulate to attending parties and affected parties not in attendance within seven days after meeting.
- .5 Agenda to include the following:
 - .1 Review and approval of minutes of previous meeting.
 - .2 Review of work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for affect on construction schedule and on completion date.
 - .12 Other business.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Definitions

- .1 Activity: element of work performed during the course of the project. Activity normally has expected duration and expected cost and resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical Bar Chart, activities or other project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally, Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five-day work week and define schedule calendar working days as part of Bar Chart (GANTT Chart) submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or another project element. Usually expressed as workdays or work weeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as a basis for decision-making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by the Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 Requirements

- .1 Ensure Master Plan and Project Schedule is practical and remain within specified Contract duration.
- .2 Plan to complete work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

1.3 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to the Departmental Representative, within 15 working days of award of Contract, a Bar Chart (GANTT Chart) as a Master Plan for planning, monitoring, and reporting of project progress.

1.4 Project Schedule

- .1 Develop a detailed Project Schedule derived from the Master Plan.
- .2 Ensure detailed Project Schedule includes milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings.
 - .3 Permits.
 - .4 Fortis Coordination.
 - .5 Mobilization.
 - .6 Field Work.

1.5 Project Schedule Reporting

- .1 Update the Project Schedule every two weeks reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of the Project Schedule, narrative report identifying work status to-date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays, and impact with possible mitigation.

1.6 Project Meetings

- .1 Discuss the Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather-related delays with their remedial measures will be discussed and negotiated.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Administrative

- .1 Submit to the Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with work affected by submittal until review is complete.
- .3 Present shop drawings and product data, in SI Metric units.
- .4 Where items or information is not produced in SI Metric units, converted values are acceptable.
- .5 Review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of work and Contract Documents. Submittals not stamped, signed, dated, and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify the Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by the Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the Departmental Representative's review.
- .10 Keep one reviewed copy of each submission on-site.

1.2 Shop Drawings and Product Data

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of work.
- .2 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in the Province of Alberta, Canada as required.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 10 working days for the Departmental Representative's review of each submission.

- .5 Adjustments made on shop drawings by the Departmental Representative are not intended to change Contract Price. If adjustments affect value of work, state such in writing to the Departmental Representative prior to proceeding with work.
- .6 Make changes to shop drawings as Departmental Representative may require, ensure they are consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data, and sample.
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable.
- .9 After the Departmental Representative's review, distribute copies.
- .10 Submit electronic copy of shop drawings for each requirement requested in Specification Sections and as the Departmental Representative may reasonably request.
- .11 Submit electronic copies of product data sheets or brochures for requirements requested in Specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copies of test reports for requirements requested in Specification Sections and as requested by Departmental Representative.
 - .1 Reports signed by authorized official of the testing laboratory where material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within three years of award of Contract.
- .13 Submit electronic copies of certificates for requirements requested in Specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material

- attesting that product, system or material meets specification requirements.
- .2 Certificates must be dated after award of Contract complete with project name.
- .14 Submit electronic copies of manufacturer's instructions for requirements requested in Specification Sections and as requested by the Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit electronic copies of Manufacturer's Field Reports for requirements requested in Specification Sections and as requested by the Departmental Representative.
 - .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .16 Submit electronic copies of Operation and Maintenance Data for requirements requested in Specification Sections and as requested by the Departmental Representative.
- .17 Delete information not applicable to project.
- .18 Supplement standard information to provide details applicable to project.
- .19 If upon review by the Departmental Representative, no errors or omissions are discovered, or if only minor corrections are made, copies will be returned and fabrication and installation of work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of work may proceed.
- .20 The review of shop drawings by Parks Canada is for the sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Parks Canada approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at the work site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of work of sub-trades.

1.3 Photographs: Digital Format

- .1 Progress Photographs
 - .1 Sizes: minimum 2 mega pixel image file size, jpeg image file.
 - .2 Format: Flash Drive.

- .3 Viewpoints: A minimum of four (4) photographs from three (3) different viewpoints will be required.
- .4 Number of photo sets: one (1) set per month.
- .5 Identification: referenced to photo file with name, location, purpose, and number of project and date of exposure.
- .6 Viewpoints: interior and exterior locations; viewpoints determined by the Departmental Representative.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 References

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Alberta.
 - .1 Occupational Health and Safety Code 2009.

1.2 Submittals

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of work. Health and Safety Plan must include:
 - .1 Results of a site-specific safety hazard assessment.
 - .2 Results of a safety and health risk or hazard analysis for site tasks and operation found in the work plan.
- .3 Submit 2 copies of the Contractor's authorized representative's work site health and safety inspection reports to the Departmental Representative and authority having jurisdiction, weekly.
- .4 Submit copies of reports or directions issued by federal and provincial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets.
- .7 The Departmental Representative will review the Contractor's site-specific Health and Safety Plan and provide comments to the Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to the Departmental Representative within 7 days after receipt of comments from Departmental Representative.
- .8 The Departmental Representative's review of the Contractor's final Health and Safety Plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to the Departmental Representative.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 Filing of Notice

- .1 File Notice of Project with Provincial authorities prior to beginning work.

1.4 Safety Requirements

- .1 The Contractor shall verify that emergency procedures including appropriate First Aid facilities and First Aid personnel are in place at the work site.
- .2 The Contractor shall also have access to the Owner's First Aid facilities. Conditions for use will be reviewed at the project kick-off meeting.
- .3 The Contractor shall employ a full-time, on-site Construction Safety Officer (CSO) who is responsible for the following:
 - .1 Providing new employee orientation.
 - .2 Overseeing site activities.
 - .3 Providing appropriate training on personal protective equipment (PPE) and WHMIS.
 - .4 Conducting and documenting accident investigations as required.
 - .5 Conducting daily work site inspections.
 - .6 Conducting weekly site safety meetings, train new employees and verifying that [Subcontractors] [Trade Contractors], Sub-subcontractors, Suppliers, and others working on-site are aware of safety requirements.
 - .7 Requirement for a full-time, on-site CSO may be waived where it can be shown that the site superintendent is certified and trained to act as the Safety Officer.
 - .8 CSO shall be certified by a training program recognized by the Alberta Construction Safety Association.
- .4 Maintain sufficient quantities of PPE on-site, including but not limited to hard hats, safety glasses, hearing protection, and other items of clothing or special equipment as necessary to verify that visitors to the site, the Departmental Representative, and the Owner's representative are adequately protected.
- .5 Verify that all Contractor's employees, Subcontractors, Sub-subcontractors, Suppliers, and others working on-site meet clothing requirements of shirts with sleeves no shorter than midway between shoulder and elbow, and full-length pants; muscle shirts or sleeveless shirts, cut-offs or shorts will not be allowed on the work site.

1.5 Meetings

- .1 Schedule and administer a Health and Safety meeting with the Departmental Representative and Owner prior to commencement of work.

1.6 Regulatory Requirements

- .1 Do work in accordance with Section 01 41 00 - Testing.

1.7 General Requirements

- .1 Develop written site-specific Health and Safety Plan based on a hazard assessment prior to beginning site work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 The Departmental Representative may respond in writing, where deficiencies or concerns are noted, and may request resubmission with correction of deficiencies or concerns.

1.8 Responsibility

- .1 Be responsible for the health and safety of persons on-site, the safety of property on-site, and for the protection of persons adjacent to the site to the extent that they may be affected by conduct of work.
- .2 Comply with, and enforce compliance, by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 Compliance Requirements

- .1 Comply with Occupational Health and Safety Act of Alberta.

1.10 Unforeseen Hazards

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occurs during performance of work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the province having jurisdiction and advise the Departmental Representative verbally and in writing.

1.11 Prime Contractor

- .1 Responsibility for Work Site Safety - This Contractor Is "Prime Contractor":
 - .1 The Contractor shall, for the purposes of the Occupational Health and Safety Act (Alberta), and for the duration of the Work of this Contract:
 - .1 Be the "Prime Contractor" for the "Work Site", and
 - .2 Meet all requirements of the Occupational Health and Safety Act and Regulations, Workers Compensation Board legislation, the Fire Code legislation, and all other applicable laws that govern work place safety.
 - .2 The Contractor shall direct all Subcontractors, Sub-subcontractors, other Contractors, employees, Suppliers, workers, and any other persons at the "Work Site" on safety-related matters, to the extent required to fulfill its "Prime Contractor" responsibilities pursuant to the Act, regardless of:
 - .1 Whether or not any contractual relationship exists between the Contractor and any of these entities, and
 - .2 Whether or not such entities have been specifically identified in this Contract.
 - .3 Safety Certification: Safety certification is a condition of Contract award; Contractor is required to maintain a valid Certificate of Recognition (COR) for the duration of the work of this Contract.

1.12 Posting of Documents

- .1 Ensure applicable items, articles, notices, and orders are posted in a conspicuous location on-site in accordance with Acts and Regulations of the province having jurisdiction, and in consultation with the Departmental Representative.

1.13 Correction of Non-Compliance

- .1 Immediately address health and safety non-compliance issues identified by the authority having jurisdiction or by the Departmental Representative.

- .2 Provide the Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 The Departmental Representative may stop work if non-compliance of health and safety regulations is not corrected.

1.14 Blasting

- .1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by the Departmental Representative.

1.15 Powder Actuated Devices

- .1 Use powder actuated devices only after receipt of written permission from the Departmental Representative.

1.16 Work Stoppage

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for work.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Definitions

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements, or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally, and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material, as well as other pollutants.

1.2 National Park Regulations

- .1 The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
- .2 The Contractor and any Subcontractors shall obtain a business license from the Parks Canada Administration Office in Banff prior to commencement of the Contract.
- .3 All Contractor's business and private vehicles are required to obtain a vehicle work pass from Parks Canada. These permits may be obtained free of charge from the Departmental Representative and Parks Canada Environmental Officer.

1.3 Canadian Environmental Assessment Act (CEAA)

- .1 Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA) 2012 and subsequent amendments.
- .2 The Contractor is required to prepare an Environmental Protection Plan (EPP) before commencing construction activities or delivery of materials to site, which will include topics in the following sub-sections.
 - .1 Name[s] of person[s] responsible for ensuring adherence to EPP.
 - .2 Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.
 - .3 Name[s] and qualifications of person[s] responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to ensure that control measures are in compliance with erosion and sediment control plan, federal, provincial, and municipal laws and regulations [and EPA 832/R-92-005, Chapter 3].

- .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on-site.
- .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
- .8 Work Site Plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work sites.
- .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .10 Non-Hazardous Solid Waste Disposal Plan identifying methods and locations for solid waste disposal including clearing debris.
- .11 Air Pollution Control Plan detailing provisions to ensure that dust, debris, materials, and trash are contained on work site.
- .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on work site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with federal, provincial, and municipal laws and regulations for storage and handling of these materials.
- .13 Waste Water Management Plan identifying methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources, and wetlands.
- .15 Pesticide Treatment Plan to be included and updated, as required.
- .3 Failure to comply with or observe environmental protection measures as identified in these Specifications may result in the work being suspended pending rectification of the problems.
- .4 The Contractor shall notify the ESO (Environmental Surveillance Officer) and the Departmental Representative in a reasonable timely manner of any actual or potential environmental incidents or failure of protection measures and immediately of any violations of environmental approvals, permits, authorizations, or EPP measures.

1.4 Reference Material

- .1 Parks Canada has provided the following reference documentation to be reviewed and followed in preparation of an EPP and throughout construction:
 - .1 Parks Canada National Best Management Practices for Roadway, Highway, Parkway and Related infrastructure 2017.

- .2 Parks Canada National Best Management Practices for Campground and Day Use Area Maintenance and Modification 2016.
- .3 Direction for Permitted Users conducting water-related activities in Banff National Park.

1.5 Relics and Antiquities

- .1 Give immediate notice to Parks Canada if evidence of an archaeological find is encountered during construction and wait for written instructions before proceeding with work in this area.
- .2 Relics and antiquities and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found on-site shall remain the property of Parks Canada. Protect such articles and request directives from Parks Canada.
- .3 Provide 48 hours notice to Parks Canada prior to commencing any work that may interfere with or affect any identified historical or archaeological site. Commence work only upon written instruction from Parks Canada.

1.6 Wildlife

- .1 Avoid or terminate activities on-site that attract or disturb wildlife.
- .2 Pets are not allowed on the work site, or in any administrative or laydown areas.
- .3 All personnel will be instructed by Parks Canada's ESO the procedures to follow in the event of wildlife appearance near or intrusion into the construction site. Personnel are not to attract or approach any wildlife seen near the site and are to vacate their location in the event of aggressive behaviour or persistent intrusion by bears, cougars, wolves, elk, or moose. The ESO and the Departmental Representative are to be notified about the circumstance immediately. Banff Dispatch will be called to determine the course of action. The general presence of wildlife observed near the construction site, any carcasses or unusual wildlife observations shall be reported to the ESO and the Departmental Representative.

1.7 Fires

- .1 Fires and burning of rubbish or any waste material on-site not permitted.
- .2 A fire extinguisher will be carried and available for use on each machine in the event of fire (e.g. ignited by a spark) to prevent the fire from burning the unit or spreading to other fuels in the work area. Basic firefighting equipment (e.g. three shovels, two pulaskis, and two 20-litre backpack pumps) shall be maintained at the construction site at a location known and easily accessible to all the Contractor's staff. Contractor's staff shall receive basic training in early response to wildlife events during the "environmental briefing".
- .3 Machinery and equipment shall be operated in a manner and with all original manufacturer's safety devices to prevent ignition of flammable materials in the area.
- .4 Care shall be taken while smoking on the construction site to ensure that accidental ignition of any flammable material is prevented.
- .5 Remnants from smoking shall be disposed of in a manner that eliminates the risk of fire.

- .6 The Contractor shall maintain an awareness of the fire danger rating (Index) in the work area by contracting the Fire Duty Officer. Fire prevention care is to be commensurate with the Fire Index.
- .7 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The ESO and the Departmental Representative shall be notified of any fire immediately.

1.8 Waste Material Storage and Removal

- .1 The Contractor shall prepare a Construction and Waste Management Plan as a part of the EPP. The Plan shall include the following basic principle:
 - .1 Waste reduction which follows the 3R hierarchy, with Reduction as the priority, followed by Reuse, then Recycle.
- .2 Wastes generated at the construction site are to be contained and removed in a timely and approved manner. The EPP shall detail the waste management procedures, including the following:
 - .1 Describe the management of waste.
 - .2 Construction wastes shall be stored in containers at an approved location and removed promptly when the containers are 90% full.
 - .3 A concerted effort to reduce, reuse, and recycle materials is expected.
 - .4 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
 - .5 Provide containers to deposit recyclable materials.
 - .6 Transport all recyclable materials to an approved recycling facility off-site.
 - .7 Waste materials are to be disposed at a certified construction waste landfill outside Banff National Park. No burying, burning, or discarding of waste materials will be permitted at the construction site, or elsewhere in Banff National Park.
 - .8 No materials attractive to wildlife are to be stored at the site overnight – daily removal is mandatory. Human food products are to be contained in a manner so as not to attract animals and food waste is to be removed from the construction site every day.
 - .9 Portable container toilets are to be provided in sufficient numbers and locations to ensure convenient usage including frequency of pump-out.
- .3 All garbage must be stored and handled in conformance with the National Parks' Garbage Regulations.
- .4 No food, domestic garbage, or hazardous wastes may be deposited in the trade waste site.
- .5 Dispose of all hazardous wastes in conformance with the Environmental Contaminates Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
- .6 Provide bear-proof garbage containers on-site for domestic garbage generated on-site by Contractor's personnel and make arrangements for collection and disposal on a daily basis, or when directed by the Departmental Representative.
- .7 Maintain the site in a tidy condition, free from the accumulation of waste products, debris, and litter.

- .8 Do not dispose of or allow dispersing waste or volatile materials such as mineral spirits, oil, or paint thinners or other hazardous wastes into waterways. Provide clean-up equipment and adequate supply of absorbent material on-site.

1.9 Drainage

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways or drainage systems. Migration to water retention pond is allowed.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.10 Site Clearing and Plant Protection

- .1 Protect trees and plants on-site and adjacent properties where indicated on Drawings and in Specifications.
- .2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping, and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated or designated by the Departmental Representative.

1.11 Work Adjacent to Waterways

- .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material.
- .3 Do not dump excavated fill, waste material, or debris in waterways.
- .4 Design and construct temporary crossings to minimize erosion to waterways.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Do not blast under water or within 100 m of indicated spawning beds.
- .8 Water withdrawal from waterways is not permitted without a permit.

1.12 Pollution Control

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant to local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.

- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.13 Spill Containment Plan

- .1 A spill response plan shall be presented in the EPP. Elements to be addressed shall include, but not necessarily limited to:
 - .1 Spill response kit capable of dealing with the largest possible spill for the equipment on-site shall be maintained in good working order on the construction site.
 - .2 Staff shall be informed of the location of the response kit and be trained in its use.
 - .3 Hazardous materials are to be stored and used in minimal required quantities in accordance with all applicable federal and provincial legislation.
 - .4 All spills are to be immediately contained with the source of spill arrested, reported to the Departmental Representative and cleanup initiated immediately. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment.

1.14 Equipment Fuelling and Maintenance

- .1 Diesel and gasoline supply vehicles, including bulk tankers shall be parked more than 100 m from rivers.
- .2 Fuel tanks with manual or electric pump delivery systems shall be used, gravity feed is not allowed.
- .3 Fuelling personnel shall maintain immediate attention to and presence at the fuelling operation.
- .4 Fuelling sites will be identified by the Departmental Representative and the ESO.
- .5 Lubricant changes and minor repairs shall be conducted at a location identified by the Departmental Representative in consultation with the ESO. Waste lubricants, used filters, and other waste maintenance products shall be removed from Banff National Park to recycling or certified disposal sites.
- .6 Equipment shall be inspected daily for fluid/fuel leaks and maintained in good working order.
- .7 Equipment to be used on the project site shall be thoroughly cleaned of soil, seeds and any debris or external contaminants outside the national park before delivery to the work site.

1.15 Notification

- .1 Departmental Representative will notify Contractor in writing of observed non-compliance with federal, provincial or municipal environmental laws or regulations, permits, and other elements of Contractor's EPP.
- .2 Contractor: after receipt of such notice, inform the Departmental Representative of proposed corrective action and take such action for approval by the Departmental Representative.
- .3 The Departmental Representative will issue a stop work order until satisfactory corrective action has been taken.

- .4 No time extensions will be granted or equitable adjustments allowed to Contractor for such suspensions.
- .5 Wildlife encounters and observations of carnivores shall be reported to Banff Dispatch Immediately at (403) 762-1473. A written record of the wildlife sighting must be submitted to the Parks Canada ESO within 24 hours of the sighting.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Concrete Management

- .1 Wet and uncured concrete/grout is an acutely toxic substance for an aquatic environment. Extra care not to introduce these materials into the environment is required. The Contractor is to prepare an EPP which addresses concrete plant location, operation, and reclamation where required, to the satisfaction of the Departmental Representative. This plan shall include the following concrete management elements:
 - .1 During saw-cutting, only pure water may be used as a cooling fluid. If possible, this fluid should be contained, collected, and disposed of at an approved location.
 - .2 Concrete mixer washout shall be contained in a buried or above-ground tank, with wash products moved back to the concrete batching yard or an approved facility for disposal.
 - .3 Water contaminated in the placing of cement and curing of concrete/grout shall be contained and removed from the site to an approved disposal facility.
 - .4 If a concrete batching plant is used it shall be operated pursuant to applicable dust, air emission, and water quality control regulations.

END OF SECTION

PART 1 GENERAL

1.1 Appointment and Payment

- .1 Contractor shall appoint and pay for services of testing laboratory.
- .2 Where tests or inspections by the Contractor-designated testing laboratory reveal work not in accordance with Contract requirements, the Contractor shall pay costs for additional tests or inspections as the Departmental Representative may require verifying acceptability of corrected work.
- .3 The Contractor shall, at no expense to the Owner, arrange for samples and test results to confirm acceptability and conformation to Specification requirements of materials to be incorporated into the work.

1.2 Contractor's Responsibilities

- .1 Furnish labor and facilities to:
 - .1 Provide access to work to be inspected and tested.
 - .2 Facilitate inspections and tests.
 - .3 Make good work disturbed by inspection and test.
- .2 Notify the Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by the Departmental Representative.

END OF SECTION

PART 1 GENERAL

1.1 Inspection/Field Review

- .1 Allow the Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice when requesting inspections if the Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If the Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 The Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and the pay cost of examination and correction. If such Work is found in accordance with Contract Documents, the Owner shall pay cost of examination and replacement.

1.2 Independent Inspection Agencies

- .1 Independent inspection/testing agencies will be engaged by the Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Owner.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection or testing, the appointed agency will request additional inspection or testing to ascertain full degree of defect. Correct the defect and irregularities, as advised by the Departmental Representative, at no cost to the Owner. Pay costs for retesting and reinspection.

1.3 Access to Work

- .1 Allow inspection/testing agencies access to Work, off-site manufacturing, and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.4 Procedures

- .1 Notify appropriate agency in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples or materials required for testing, as specifically requested in Specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

- .3 Provide labour and facilities to obtain and handle samples and materials on-site. Provide sufficient space to store and cure test samples.

1.5 Rejected Work

- .1 Remove defective Work, whether as a result of poor workmanship, use of defective products or damage, and whether incorporated in Work or not, which has been rejected by the Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work, that's damaged by such removals or replacements, promptly.
- .3 If, in the opinion of the Departmental Representative it is not expedient to correct defective work or work not performed in accordance with Contract Documents, the Owner will deduct from Contract price difference in value between work performed and that called for by Contract Documents, amount of which will be determined by the Departmental Representative.

1.6 Reports

- .1 Submit electronic copies of inspection and test reports to the Departmental Representative.
- .2 Provide copies to the Subcontractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

- .1 Provide all temporary facilities necessary to carry out the Work. Remove all temporary facilities upon completion and reinstate the site, services, and structures to their prior or better condition.

1.1 Contractor's Office

- .1 Provide and maintain in clean condition, during the entire progress of the Work, a suitable office, adequately lighted, heated and ventilated, for own use.
- .2 The office shall be of suitable size to accommodate site meetings.
- .3 Completely furnish office to allow for filing and examination of Contract Documents and regulatory documents, and to properly acknowledge instructions received from the Departmental Representative.
- .4 Provide, within office space, adequate first aid facilities as recommended by the Labour and Workers Compensation regulations.

1.2 Subcontractors' Offices

- .1 Subcontractors are to provide own offices as necessary.

1.3 Equipment and Tool Storage

- .1 Provide and maintain, in clean and orderly fashion, adequate lockable storage sheds for tools and equipment.

1.4 Material Storage

- .1 Provide and maintain in a clean orderly condition suitable weatherproof and lockable sheds for storage and protection of materials which require such protection.
- .2 Allocate storage sheds on-site for materials which do not require weatherproof sheds. Maintain areas in clean and orderly condition. Limit storage of materials and items to storage areas only.
- .3 Move stored products or equipment which interfere with operations of the Owner, Departmental Representative, or other Contractors.

1.5 Temporary Sanitary Facilities

- .1 Provide sanitary facilities for workers of this Contract in accordance with local health authorities. Maintain facilities in a clean and tidy condition.

1.6 Temporary Water Supply

- .1 Provide and pay for water as required for construction in this Contract.

1.7 Temporary Heating and Ventilating

- .1 Pay for costs of temporary heat and ventilation used during construction, including cost of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted.

- .2 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of work.
 - .2 Protect work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation, and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .3 Maintain minimum temperature of 10°C or higher, where specified, as soon as finishing work is commenced and maintain until acceptance of structure by the Departmental Representative.
 - .1 Maintain ambient temperature and humidity levels as required for comfort of personnel.
- .4 Ventilating:
 - .1 Prevent hazardous accumulations of dust, fumes, mists, vapours, or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in a manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.
- .5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.

1.8 Temporary Power and Light

- .1 Arrange, pay for, and maintain any temporary electrical power supply required for construction in the Contract in accordance with governing regulations and ordinances.
- .2 Install temporary facilities for power such as pole lines and underground cables to approval of local power supply authority.

1.9 Temporary Telephone

- .1 Provide and pay for temporary telephones necessary for own use.
- .2 Make own telephone available for use by all Subcontractors engaged for placing and receiving calls.

1.10 Drainage

- .1 Refer to Section 01 35 43 - Environmental Procedures for site drainage and pumping requirements.

1.11 Temporary Access

- .1 Provide any access roads required for access to and on-site as required to carry out the Work of this Contract.
- .2 The Contractor shall construct and maintain detours around the construction area.

1.12 Parking

- .1 The Contractor is responsible for preparation and maintenance of own parking area.

END OF SECTION

PART 1 GENERAL

- .1 Regulate traffic in accordance with the Manual of Uniform Traffic Control Devices for Canada (MUTCD) December 2009 (distributed by Roads and Transportation Association of Canada), except where specified otherwise.

1.1 Protection of Public Traffic

- .1 Comply with requirements of Acts, Regulations and Bylaws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out work of haul materials or equipment.
- .2 When working on travelled roadway:
 - .1 Place equipment in position to present minimum interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions will permit, and preferably on same side of travelled roadway.
 - .3 Do not leave equipment on travelled roadway overnight.
- .3 Do not close any road lanes or highway without approval of the Authority and the Departmental Representative. Before rerouting traffic, erect suitable signs and devices in accordance with instruction contained in Part D of MUTCD. Provide sufficient crushed gravel to ensure a smooth riding surface during work.
- .4 Keep travelled roadway well-graded, free of pot holes, and of sufficient width that the required number of lanes of traffic may pass.
- .5 When directed by the Departmental Representative, provide well-graded detours or temporary roads to facilitate passage of traffic around restricted construction area. Provide and maintain signs and lights and maintain roadway.
- .6 Provide and maintain reasonable road access and egress to property fronting, along or in vicinity of work under Contract.

1.2 Informational and Warning Devices

- .1 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from project work which may require road user response.
- .2 Supply and erect signs, delineators, barricades, and miscellaneous warning devices as specified in Part D, Temporary Conditions Signs and Devices, of the MUTCD.
- .3 Place signs and other devices in locations recommended in the MUTCD.
- .4 Submit to the Departmental Representative, prior to commencement of work, a list of signs and other devices required for project.
- .5 Continually maintain traffic control devices in use by:
 - .1 Checking signs daily for legibility, damage, suitability and location. Clean, repair, or replace to ensure clarity and reflectance.
 - .2 Removing of sign covering which does not apply to conditions existing from day-to-day.

1.3 Control of Public Traffic

- .1 Provide flag person, trained in accordance with and properly equipped, as specified in the MUTCD, in following situations:
 - .1 When public traffic is required to pass working vehicles or equipment which may block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .3 When workmen or equipment are employed on travelled roadway over brow of hills, around sharp curves, or at other locations where oncoming traffic would not otherwise have adequate warning.
 - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - .5 For emergency protection when other traffic control devices are not readily available.
 - .6 In situations where complete protection for workmen, working equipment and public traffic is not provided by other traffic control devices.
 - .7 At each end of restricted sections where pilot cars are required.
- .2 Provide pilot cars where public traffic must use particularly hazardous routes or where traffic is required to remain in one lane or change periodically from one lane to another or negotiate sections of construction at restricted speed. Equip pilot cars with orange flashing lights and signs clearly designating vehicles as pilot cars.

END OF SECTION

PART 1 GENERAL

- .1 Use new material and equipment, unless otherwise specified.
- .2 Within 7 days of written request by the Departmental Representative, submit following information for materials and equipment proposed for supply:
 - .1 Name and address of manufacturer.
 - .2 Trade name, model, and catalogue number.
 - .3 Performance, descriptive, and test data.
 - .4 Manufacturer's installation or application instructions.
 - .5 Evidence of arrangements to procure.
- .3 Use products of one manufacturer for material and equipment of same type or classification, unless otherwise specified.

1.1 Manufacturer's Instructions

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify the Departmental Representative in writing of any conflict between these Specifications and manufacturer's instructions. The Departmental Representative will designate which document is to be followed.

1.2 Delivery and Storage

- .1 Deliver, store, and maintain packaged material and equipment with manufacturer's seals and labels intact.
- .2 Prevent damage, adulteration, and soiling of material and equipment during delivery, handling, and storage. Immediately remove rejected material and equipment from site.
- .3 Store material and equipment in accordance with Supplier's instructions.
- .4 Touch-up damaged factory finished surfaces to the Departmental Representative's satisfaction. Use coating as recommended by the manufacturer and approved by the Departmental Representative to match original. Do not paint over nameplates.

1.3 Acceptability of Materials

- .1 Requests for "acceptance" of materials in addition to those presently established as "acceptable" by the Contract Documents shall be submitted in duplicate to the Departmental Representative.

1.4 Conformance

- .1 When material or equipment is specified by standard or performance specifications, upon request of the Departmental Representative, obtain from the manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.5 Construction Equipment and Plant

- .1 On request, prove to the satisfaction of the Departmental Representative that the construction equipment and plant are adequate to manufacture, transport, place, and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant, as directed.
- .2 Maintain construction equipment and plant in good operating order.

END OF SECTION

PART 1 PRODUCTS

1.1 Quality of Products

- .1 All materials, equipment, and articles incorporated in the Work are to be new, not damaged or defective, and of the best quality for the purpose intended. If requested, furnish evidence as to type, source, and quality of products provided.
- .2 Defective materials, or installations whenever found, will be rejected, regardless of previous inspections. Inspection by the Departmental Representative does not relieve the Contractor of responsibility. The Contractor shall remove and replace defective materials at its own expense and be responsible for all unnecessary delays and expenses caused by rejection.
- .3 Should any dispute arise as to the quality or fitness of materials, equipment, or articles, the decision rests strictly with the Departmental Representative based upon the requirements of the Contract.
- .4 Unless otherwise indicated in the Specifications, maintain uniformity of manufacturer for any particular or like item throughout the project.
- .5 Permanent labels, trademarks, and nameplates on materials, equipment, and articles are not acceptable in prominent locations, except where required for operating instructions.

1.2 Availability of Products

- .1 Immediately upon award of Contract, the Contractor shall review product delivery requirements and identify any foreseeable supply delays for any items. If delays in supply of materials, equipment, or articles are identified, notify the Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the Work.
- .2 In the event of failure to notify the Departmental Representative at commencement of the Work, and should it subsequently appear that the Work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products, at no increase in Contract Price.
- .3 To receive approval, proposed substitutes must equal or exceed the quality, finish, and performance of those specified and/or shown, and must not exceed the space requirements allotted on the drawings.

1.3 Storage, Handling and Protection of Products

- .1 Handle and store products in a manner to prevent damage, deterioration, and soiling and in accordance with manufacturer's recommendations when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in the Work.
- .3 Products subject to damage from weather are to be stored in weatherproof enclosures.

- .4 Remove and replace damaged products at own expense and to the satisfaction of the Departmental Representative.

1.4 Manufacturer's Direction

- .1 Unless otherwise indicated in the Specifications, install or erect all products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain instructions directly from the manufacturer.
- .2 Notify the Departmental Representative, in writing, of any conflicts between the Specifications and manufacturer's instructions, so that the Departmental Representative may establish the course of action to follow.
- .3 Products installed improperly shall be removed and reinstalled at no increase in Contract Price.

1.5 Transportation Costs of Products

- .1 Pay the costs of transportation of products required in the performance of the Work.
- .2 Transportation costs of products supplied by the Owner will be paid for by the Owner. Be responsible for loading, handling, and storage of such products, unless indicated otherwise in Specifications.

PART 2 WORKMANSHIP

2.1 General Requirements

- .1 Workmanship is to be of the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Departmental Representative if work is required in such a manner as to make it impractical to produce required results.
- .2 At all times, enforce discipline and good order among workers. Do not employ any unfit person or anyone unskilled in the duties assigned to him/her.
- .3 Decisions as to the quality or fitness of workmanship in cases of dispute rests solely with the Departmental Representative, whose decision is final.
- .4 Replace work which is not in accordance with the Specifications when so directed by the Departmental Representative.

2.2 Coordination

- .1 Ensure full co-operation among all workers in laying out work. Maintain efficient and continuous supervision.
- .2 Be responsible for the proper coordination and placement of openings, sleeving, and accessories.

2.3 Protection of Work in Progress

- .1 Adequately protect all work completed or in progress. Any work damaged or defaced is to be removed and replaced, or repaired, as directed by the Departmental Representative, at no additional cost to the Owner.

- .2 Prevent overloading of any part of the structure. Do not cut, drill, or otherwise sleeve any load-bearing structural member, unless indicated specifically on drawings or in Specifications, without written approval of the Departmental Representative.

PART 3 PAYMENT FOR PRODUCTS AND WORKMANSHIP

3.1 Measurement and Payment

- .1 There is no separate Measurement and Payment for items in Products Workmanship. Include as incidental to the work.

END OF SECTION

PART 1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti- pollution laws.
- .2 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .3 Provide adequate ventilation during use of volatile or noxious substances.

1.1 Materials

- .1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.2 Cleaning During Construction

- .1 Provide on-site dump containers for collection of waste materials and debris.
- .2 Dispose of waste materials and debris off-site.
- .3 Schedule cleaning operations so that resulting dust, debris, and other contaminants will not fall on newly paved surfaces.

1.3 Final Cleaning

- .1 Broom clean-paved surfaces, curbs, and gutters; rake clean other surfaces of grounds.
- .2 Remove debris and surplus materials from site.

END OF SECTION

PART 1 RECORD DRAWINGS

- .1 The Departmental Representative will provide two sets of white prints for record drawing purposes.
- .2 Maintain project record drawings and accurately record deviations from Contract Documents.
- .3 Record changes in red on one set of prints.
- .4 Record following information:
 - .1 Depths of various elements of foundation in relation to survey datum.
 - .2 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
 - .3 Field changes of dimension and detail.
 - .4 Changes made by Change Order or Field Order.
- .5 At completion of project and prior to final inspection, neatly transfer notations to second set and submit both sets to the Departmental Representative.

PART 2 PAYMENT FOR PROJECT RECORDS

2.1 Measurement and Payment

- .1 There is no separate Measurement and Payment for items in Project Records. Include as incidental to the work.

END OF SECTION

PART 1 GENERAL

1.1 Clean-up and Final Cleaning of Work

- .1 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .2 In addition to the progressive removal of waste materials and debris from work site perform the following, before Construction Completion Certificate inspection by the Departmental Representative, for the work sites comprising this Contract:
 - .1 Remove all foreign material from landscaped area.
 - .2 Remove all grade stakes, survey lathe, and other related survey or protective materials use to aid the performance of the Work.

1.2 Restoration

- .1 Restore all surfaces, including locations of work site trailers and laydown areas, landscaped areas, structures, and services damaged due to the Work to the satisfaction of the Departmental Representative.

PART 2 PAYMENT FOR PROJECT CLEANUP

2.1 Measurement and Payment

- .1 There is no separate Measurement and Payment for items in Project Clean up. Include as incidental to the work.

END OF SECTION

PART 1 GENERAL

1.1 Inspection and Declaration

- .1 Contractor's Inspection: Contractor and Subcontractors - conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify the Departmental Representative in writing of satisfactory completion of Contractor's inspection and that corrections have been made.
 - .2 Request the Departmental Representative's review.
 - .3 The Departmental Representative's Review: the Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .2 Completion: submit written certificate that the following have been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Equipment and systems have been tested, adjusted and balanced, and are fully operational.
 - .4 Certificates required by utility companies have been submitted.
 - .5 Operation of systems have been demonstrated to Owner's personnel.
 - .6 Work is complete and ready for final inspection.
- .3 Final Review: when items noted above are completed, request final inspection of Work by Owner, Departmental Representative, and Contractor. If Work is deemed incomplete by Owner and the Departmental Representative, complete outstanding items and request reinspection.
- .4 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .5 Final Payment: when Owner and the Departmental Representative consider final deficiencies and defects have been corrected, and it appears requirements of the Contract have been totally performed, make application for final payment. If Work is deemed incomplete by Owner and the Departmental Representative, complete outstanding items and request reinspection.
- .6 Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with Construction Contract.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Submittals

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3 Copy will be returned after final review, with the Departmental Representative's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, two final copies of operating and maintenance manuals in English along with a .pdf version on a flash drive in English.
- .6 Furnish evidence, if requested, for type, source, and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.
- .9 Submit `redline` marked up construction drawings to the Departmental Representative within 30 days of Substantial Performance and prior to completion.

1.2 Format

- .1 Organize data as instructional manual.
- .2 Binders: hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, process flow, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

1.3 Contents - Each Volume

- .1 Table of Contents: provide title of project:
 - .1 Date of submission; names.
 - .2 Addresses and telephone numbers of the Departmental Representative and Contractor with name of responsible parties.

- .3 Schedule of products and systems; indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of Subcontractors and Suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.4 As-Builts

- .1 Maintain at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Tender. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry, and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by the Departmental Representative.

1.5 Recording Actual Site Conditions

- .1 Record information on set of drawings, and in copy of Project Tender, provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .2 Field changes of dimension and detail.
 - .3 Changes made by change orders.
 - .4 Details not on original Contract drawings.
 - .5 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product installed, particularly optional items and substitute items.
 - .2 Changes made by addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual Specifications Sections.

1.6 Guarantees

- .1 In addition to guarantee requirements contained elsewhere in the Contract Documents, the work done under this Contract is to be guaranteed for two years after the date of issue of the Construction Completion Certificate by the Departmental Representative.
- .2 Upon completion of the Work, furnish to the Owner a guarantee in writing, stating that the Contractor will make good, at his expense, and to the satisfaction of the Departmental Representative all defects that may develop in materials and equipment used on the work for a minimum period of two years from date of Construction Completion Certificate, upon the Owner assuming custody, that are in the opinion of the Departmental Representative due to the use of improper workmanship and faulty materials and equipment.
- .3 The Contractor is to, in the case of work performed by his Subcontractors and when guarantees are required, secure such guarantees from the Subcontractor and furnish them to the Owner on or before completion of the Work.
- .4 The guarantees are to provide that all work furnished and installed by the guarantors are to remain in like new condition and working order for the period of two years, and that the guarantors will replace same with new and like materials, at no expense to the Owner unless it can be proven that the defects are caused by abuse and negligence on the part of the Owner or its employees.
- .5 It is to be understood that in effecting the replacement, the Contractor or Subcontractor responsible is to also bear all costs involved in removing or replacing adjacent affected materials.
- .6 One month prior to expiry of guarantee period, the Departmental Representative will carry out a detailed inspection of the work site.
- .7 Any defect apparent will be noted and will be forwarded to the Contractor in writing for correction under the terms of the Contract.

1.7 Pre-warranty Meeting

- .1 Convene meeting two weeks prior to Contract completion with Consultant and Contractor in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify project requirements.
 - .2 Review warranty requirements.
- .2 Consultant to establish communication procedures for:
 - .1 Notify Contractor of construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
- .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number, and address of company authorized for construction warranty work action.
- .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Description

- .1 This Section specifies requirements for demolishing, salvaging, and removing wholly or in part, various items designated to be removed or partially removed from the work.

1.2 Work Included

- .1 Provide all labour and equipment required for the demolition work, including but not limited to:
 - .1 Removal of concrete from barrier, curb, abutment, and deck as designated by the Department Representative or indicated on the Contract Drawings.
 - .2 Disposal of materials.

1.3 Reference Standards

- .1 All standards to be latest issue at time of tender.
- .2 CSA S350: "Code of Practice for Safety in Demolition of Structures".

1.4 Regulations

- .1 Abide by the current bylaws and regulations of the province and/or municipality in which the work is located and abide by the current laws and regulations with regard to public safety.
- .2 The regulations of the Occupational Health and Safety Act, the Workers' Compensation Board, and other applicable acts administered by the authority having jurisdiction of the province apply to the work of this Section.

1.5 Permits

- .1 The Contractor, on the Owner's behalf, will obtain and pay for all demolition permits. The Contractor is to pay all other charges which may be incurred in connection with demolition operations on the said lands including the cost of any additional service or utility installations required by demolition operations.

1.6 Visit and Examine Site

- .1 Visit and examine the site and become thoroughly familiar with all features, characteristics, and existing conditions affecting the work.
- .2 Examine previously constructed work. Notify the Department Representative in writing of any conditions which may prejudice proper completion of this work. Commencement of work implies acceptance of existing conditions.
- .3 No allowances will be made by the Owner for any conditions not anticipated or for any difficulties encountered due to any features or peculiarities of the site or existing conditions which exist at the time of examination prior to submission of bid.

1.7 Protection

- .1 Protect existing items designated to remain and materials designated for salvage. In the event of damage to such items, immediately replace or make repairs to the approval of the Department Representative and at no cost to the Owner.
- .2 Cease operations and notify the Department Representative immediately if the safety of the structure appears to be endangered. Take all precautions to properly support the structure. Do not resume operations until reviewed with the Department Representative.
- .3 Comply with General Requirements and Contract Drawings for protection of vehicle traffic.
- .4 Ensure debris is not allowed to fall onto any roadway, pedestrian walkway, or within any watercourse below the bridge or adjacent to the work site.
- .5 Ensure the safety of all persons in areas which are not enclosed and protected with barriers preventing access to the public or workers. Provide, erect, and maintain hoarding, barricades, lighting, guardrails, and other protection as required by local authorities' regulations and bylaws to provide full protection for the public and workers.
- .6 Do not demolish any electrical or mechanical components before they have been identified. Notify the Department Representative if mechanical or electrical components or systems are encountered whose disposition (to be demolished or to be retained) is not described in the drawings.

1.8 Safety

- .1 Carry out demolition work in accordance with CSA S350 Code of Practice in Demolition of Structures and current Occupational Health and Safety Act construction safety regulations.

1.9 Qualifications

- .1 The Owner may refuse to consider the offer of any Contractor who does not have a license from the authority having jurisdiction entitling him to carry out demolition work.

1.10 Demolition Drawings

- .1 Submit for approval drawings, diagrams, or details showing the sequence of disassembly work or supporting structures and underpinning where required by authorities having jurisdiction. Do not commence with demolition work until these drawings have been approved by the authority having jurisdiction.
- .2 Drawings for structural elements are to bear the stamp of a qualified professional engineer registered in the Province of Alberta.

PART 2 PRODUCTS

2.1 Equipment – Concrete Removal

- .1 Power-driven hand tools for removal of concrete to the depths required will be permitted with the following restrictions:
 - .1 Jack hammers heavier than nominal 14 kg class and chipping hammers heavier than normal 7 kg class shall not be used to remove concrete.
 - .2 Mechanical scabblers, 8 mN (6 ft.lb.) impact, and grinders capable of removing the concrete and producing the specified finished surface.
 - .3 Concrete cutting saws capable of sawing to the depths indicated on drawings.

PART 3 EXECUTION

3.1 Salvage

- .1 Carefully dismantle items containing materials for salvage. Transport and stockpile salvaged material as indicated or directed by the Department Representative.
- .2 Carefully dismantle items containing materials directed or indicated for salvage. Stockpile salvaged materials at locations directed or indicated.

3.2 Disposal

- .1 All demolished materials are to be disposed of off-site except where noted otherwise.
- .2 Unsuitable concrete and asphaltic material shall be hauled to site designated by the Owner. The material shall be stockpiled at the designated location. Re-useable material may be salvaged by the Contractor for their own use.
- .3 All landfill charges and/or disposal costs are to be included in the Tender amount.

3.3 Preparation

- .1 Inspect site and verify with the Department Representative items designated for removal and items to be preserved.
- .2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.
- .3 Notify utility companies before starting demolition.
- .4 Report any unanticipated conditions such as dead or unidentified services and utility lines to the Department Representative.
- .5 Provide a sawcut to the depth noted on the Contract Drawings along the edge of all concrete removal to delineate the edge of the concrete removal. If removal extends past this sawcut, the Contractor is to re-establish sawcut to encompass the new area and remove concrete to the depth to match the adjacent area at no additional cost to the Owner.

3.4 Demolition/General

- .1 At the end of each day's work, leave work in a safe condition so that no part is in danger of toppling or falling.
- .2 Demolish in a manner to minimize dusting. Keep dusty materials wet.
- .3 Selling or burning materials on-site is not permitted.
- .4 Carry out demolition in a manner to cause as little inconvenience as possible to the public and to other Contractors.
- .5 Carry out demolition in an orderly and careful manner.
- .6 Do not employ demolition by explosives or methods which might initiate a "rapid progressive failure" of any portion of a structure.
- .7 Lower waste materials in a controlled manner. Do not drop, allow to fall, or throw materials from heights.
- .8 As demolition progresses, immediately repair any resulting damage to existing parts intended to remain.
- .9 In the event of a deck blow-through, the Contractor and Department Representative shall assess the extent of damaged area. The Contractor is to provide a written description of the repair procedure for review by the Department Representative. All costs associated with a deck blow-through shall be paid by the Contractor.

3.5 Clean-Up

- .1 Remove all debris and rubbish from site at regular intervals.
- .2 Leave site free of all debris and rubbish. Broom clean hard surfaces.

3.6 Restoration

- .1 Upon completion of work, remove debris, trim surfaces, and leave work site clean.
- .2 Reinstate areas and existing works outside areas of demolition to match the condition of adjacent, undisturbed areas. No separate payment will be made for this rehabilitation work.

END OF SECTION

PART 1 GENERAL

1.1 Governing Specifications

- .1 Complete asphalt paving in accordance with Section 17 "ASPHALT CONCRETE PAVEMENT" of the Alberta Transportation Standard Specifications for Bridge Construction, Edition 16, 2017 (SSBC).
- .2 Complete asphalt paving in accordance with Section 16 "WATERPROOFING" of the Alberta Transportation Standard Specifications for Bridge Construction, Edition 16, 2017 (SSBC).
- .3 SSBC may be downloaded from the Alberta Transportation website at the following link:
<http://www.transportation.alberta.ca/Content/docType246/Production/StandardSpecificationsforBridgeConstruction2017.pdf>.

1.2 Basic Requirements

- .1 Asphalt mix to be Type M1 with PG 52-34 asphalt cement grade.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not Used.

PART 3 EXECUTION

3.1 Not Used

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 Scope of Work

- .1 Scope of work shall be to provide formwork that is of high-quality and consistent with producing exposed concrete surfaces that are free of unsightly joints, blemishes, bugholes, honeycombing, and other surface defects. All formed surfaces shall have symmetrical joint patterns where applicable.

1.2 Related Work

- .1 Concrete Repair Section 03 70 00
- .2 Concrete Reinforcement Section 03 20 00

1.3 Reference Standards

- .1 All standards shall be latest issue at time of Tender:
 - .1 CAN/CSA-A23.1, "Concrete Materials and Methods of Concrete Construction".
 - .2 CAN/CSA-A23.2, "Methods of Test and Standard Practices for Concrete".
 - .3 CSA O86S1, Supplement No. 1 to CAN/CSA-O86-01, "Engineering Design in Wood".
 - .4 CSA O121, "Douglas Fir Plywood".
 - .5 CSA O151, "Canadian Softwood Plywood".
 - .6 CSA O153, "Poplar Plywood".
 - .7 CAN/CSA-O325.0, "Construction Sheathing".
 - .8 CSA O437, "Standards for OSB and Waferboard".
 - .9 CSA S269.1, "Falsework for Construction Purposes".
 - .10 CAN/CSA S269.3, "Concrete Formwork, National Standard of Canada".
 - .11 CAN/ULC-S701, "Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering".

1.4 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework stamped and signed by a professional engineer registered in the province of Alberta.
- .3 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1 for falsework drawings. Comply with CAN/CSA S269.3 for formwork drawings.
- .4 Indicate formwork design data including the permissible rate of concrete placement and the expected temperature of concrete in forms.
- .5 Indicate sequence of erection and removal of formwork and falsework as directed by the Departmental Representative. Indicate sequence of re-shoring, if required.

PART 2 PRODUCTS

2.1 Materials

- .1 Formwork materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA O121, CAN/CSA O86, CSA-O437 Series, and CSA O153, as applicable.
 - .2 For concrete with special architectural features, use formwork materials to CAN/CSA A23.1/A23.2.
 - .3 Rigid insulation board to CAN/ULC-S701.
- .2 Pile extension forms may be spirally wound laminated fibre forms or steel-faced forms internally treated with release material.
- .3 Form ties:
 - .1 For concrete not permanently exposed to view, use removable or snap off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
 - .2 For concrete permanently exposed to view, use snap ties complete with plastic cones and light grey concrete plugs.
- .4 Form release agent shall be non-toxic.
- .5 Form stripping agent shall be a colourless mineral oil, free of kerosene, with viscosity between 15 to 24 mm²/s at 40°C, flashpoint minimum 150°C, open cup.
- .6 Falsework materials shall be to CSA S269.1.

PART 3 EXECUTION

3.1 Fabrication and Erection

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .3 Fabricate and erect falsework in accordance with CSA S269.1.
- .4 Do not place shores and mud sills on frozen ground.
- .5 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .6 Fabricate and erect formwork in accordance with CAN/CSA S269.3 to produce finished concrete conforming to shape, dimensions, locations, and levels indicated within tolerances required by CAN/CSA A23.1/A23.2.
- .7 Align form joints and make watertight. Keep form joints to a minimum.
- .8 Use 20 mm chamfer strips and 20 mm fillets at exposed edges and corners, as shown on the Contract Drawings, or as directed by the Departmental Representative.
- .9 Form chases, slots, openings, drips, recesses, expansion, and control joints as shown on the Contract Drawings or as directed by the Departmental Representative.

- .10 Build in anchors, sleeves, and other inserts required to accommodate project work as shown on the Contract Drawings. Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .11 Clean formwork in accordance with CAN/CSA A23.1/A23.2, before placing concrete.

3.2 Removal and Re-shoring

- .1 Leave formwork in place for three days (minimum) after placing concrete or as otherwise noted on plans or indicated in related Sections.
- .2 Remove formwork and falsework only if concrete has achieved sufficient strength and stability.
- .3 Provide necessary re-shoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Re-use formwork and falsework subject to requirements of CAN/CSA A23.1/A23.2.

3.3 Payment

- .1 All materials, labour, and equipment required to supply, erect, and remove formwork, falsework, and re-shoring with cast-in-place concrete or grout is considered to be incidental to the work. No separate payment will be made for this work.

END OF SECTION

PART 1 GENERAL

This Specification shall cover the supply, fabrication, and placement of uncoated, hot dip galvanized, stainless, and epoxy-coated reinforcing steel. Reinforcing bars shall be supplied in the lengths and shapes, and shall be installed, as indicated on the Contract Drawings or as stipulated by reference standards, upon consent of the Departmental Representative. Use of epoxy-coated reinforcing is not acceptable unless approved and requires approval on project-specific basis.

1.1 Work Included

- .1 Plain, galvanized and stainless reinforcing steel bars for cast-in-place or precast concrete complete with tie wire.
- .2 Support chairs, bolsters, bar supports, and spacers for reinforcing.
- .3 Fabrication, storage, handling, placing, splicing, and fastening.

1.2 Related Work

- .1 Cast-in-Place Concrete.
- .2 High Performance Concrete.
- .3 Precast Concrete.
- .4 Concrete Repairs.
- .5 Other Specifications relevant to the Project.

1.3 Reference Standards

- .1 Comply with the Canadian Standards requirements of CAN/CSA-S6 Canadian Highway Bridge Design Code, CSA G30.18M, and CSA A23.1, A23.2, and A23.3 (latest editions) as applicable, except where otherwise specified.
- .2 Galvanizing to ASTM A767 (latest edition) "Zinc – Coated (Galvanized) Steel Bars for Concrete Reinforcement", except as specified herein.
- .3 ASTM A780 (latest edition) "Repair of Damaged and Uncoated Areas of Hot – Dip Galvanized Coatings".
- .4 ASTM A143 (latest edition) "Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement".
- .5 Epoxy Coating to ASTM A775/A775M (latest edition) "Standard Specification for Epoxy Coated Steel Reinforcing Bars".
- .6 ASTM D3963/D3963M (latest edition) "Standard Specification for Fabrication and Jobsite Handling of Epoxy Coated Steel Reinforcing Bars".
- .7 ASTM A276 (latest edition) "Stainless Steel Bars and Shapes".
- .8 ASTM A955M (latest edition) "Deformed and Plain Stainless Steel Bars for Concrete Reinforcement".
- .9 ASTM A185 (latest edition) "Steel Welded Wire Reinforcement, Plain, for Concrete".

- .10 ASTM A497M (latest edition) "Steel Welded Wire Reinforcement, Deformed, for Concrete".
- .11 Reinforcing Steel Institute of Canada - Reinforcing Steel Manual of Standard Practice (latest edition).

1.4 Quality Control

- .1 The Contractor shall be wholly responsible for the quality of materials and products provided for incorporation in the work and for the quality of the work. The Contractor shall provide a Quality Control Plan at the beginning of project.
- .2 The Contractor shall perform inspections and testing necessary to ensure that the work conforms to the requirements of the Contract Documents, and shall provide copies of such test reports for the Departmental Representative's review before proceeding with construction. The standard tests include but are not limited to: mill test reports of reinforcement supplied indicating physical and chemical analysis, test results (elongation, strength), reports from fabrication and galvanizing of reinforcing steel, test results for bar support chairs, bolsters, and spacers.
- .3 The Contractor shall provide copies of inspection and test reports to the Sub-contractor of work being performed.
- .4 Work shall conform to the standards, as referenced in the Contract Documents and in this Specification. All non-conforming work shall be replaced and repaired at the Contractor's expense at the discretion of the Departmental Representative.

1.5 Quality Assurance

- .1 The Owner will undertake, through an independent CSA certified testing firm, random sampling, inspection, and testing to determine compliance with the Specifications and other Contract Documents.
- .2 The Contractor shall provide access to all portions of work, storage or loading areas, manufacturing and fabrication plants, and co-operate with the Owner's representatives.
- .3 The Contractor shall allow ample time for notification, inspection, corrective work, if required, and obtain the Departmental Representative's approval before scheduling concrete placement.
- .4 The Contractor shall submit shop drawings for review by the Departmental Representative in accordance with Section 01 33 00 . The shop drawings shall be legible and of adequate quality to be reproduced and scanned. Review of shop drawings by the Departmental Representative shall not be construed as relieving the Contractor from the responsibility for errors and omissions. The Contractor remains responsible for the work as per its obligations under the Contract.
- .5 The Contractor shall submit an original of a Certificate of Compliance from a galvanizing applicator confirming that the hot dip galvanizing process and the amount and quality of coating meets or exceeds the specified requirements.
- .6 The Contractor shall submit proof that applicator of epoxy coating is certified by the manufacturer and that the application is certified under the Concrete Reinforcing Steel Institute (CRSI) Voluntary Certification Program for Fusion Bonded Epoxy Coating Applicator Plants.

- .7 Concrete reinforcement shall be inspected "in place". The Contractor shall notify the Departmental Representative when reinforcing installation is complete and before forms are closed, minimum 24 hours in advance of any concrete placement.
- .8 If, in the opinion of the Departmental Representative any reinforcing steel provided for the concrete works exhibit flaws in manufacture, galvanizing, epoxy coating, or field contamination of stainless steel, such material shall be immediately removed from the site and replaced with acceptable reinforcing steel.
- .9 In case of an ambiguity whether the product, system, or work conforms to the applicable standards and Contract Documents, the Departmental Representative reserves the right to have such product or system tested or re-inspected to ascertain conformance. The cost of such testing will be borne by the Owner in the event of conformance and by the Contractor in the event of non-conformance. Any non-conformant work shall be rejected at the Departmental Representative's discretion and replaced and repaired by the Contractor at its sole expense.

PART 2 PRODUCTS

2.1 Materials

- .1 Reinforcing steel shall conform to CSA G30.18:
 - .1 Grade 400R shall be used for plain and epoxy-coated reinforcement (without galvanized coating). Additional requirements for grade 400R as stipulated by latest edition of Clause 8.4.2.1 of CAN/CSA-S6, shall apply.
 - .2 Grade 400W shall be used for galvanized reinforcement.
- .2 Galvanized reinforcing shall also conform to ASTM A767M, "Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement". Coating to conform to Class II (610 g/m²). Supplementary requirement S1 shall apply.
- .3 Chromating of galvanized coating may be omitted.
- .4 Stainless steel reinforcement shall conform to ASTM A276 "Stainless Steel Bars and Shapes"; and ASTM A955M "Deformed and Plain Stainless Steel Bars for Concrete Reinforcement", including annexes, minimum Grade 420.
- .5 Stainless steel reinforcement shall be one of the designations as defined by the Unified Numbering System (UNS) that is on the approved product list of Alberta Transportation's latest edition of Standard Specifications for Bridge Construction, Section 5 Reinforcing Steel. Proof of compliance with relevant test standards such as ASTM A262, Practice E for Austenitic grades; and/or ASTM A923, Method A for Duplex grades, shall be supplied for the appropriate steel type. Only one type of stainless steel shall be used throughout the project.
- .6 Epoxy-coated reinforcing shall conform to ASTM A775/A775M, "Standard Specification for Epoxy Coated Steel Reinforcing Bars". Coating shall be Scotchcote 213, Fusion Bonded epoxy coating, thickness 300 + 85 micrometres as manufactured by the 3M Company or Approved equivalent.
- .7 Wire mesh, if specified, shall be supplied in flat sheets only and shall conform to ASTM A185 (latest edition) "Steel Welded Wire Reinforcement, Plain, for

Concrete”; and ASTM A497M (latest edition) “Steel Welded Wire Reinforcement, Deformed, for Concrete”.

2.2 Accessory Materials

- .1 Tie Wire: minimum 1.6 mm annealed type or patented system approved by the Departmental Representative. Plastic coated tie wires shall be used for galvanized, stainless steel, or epoxy-coated reinforcing.
- .2 Chairs, Bolsters, Bar Supports, and Spacers: adequately sized for strength and support of reinforcing steel during construction. Metal chairs shall be galvanized for reinforcing and shall conform to CSA G40.20/G40.21. Chairs and spacers for stainless steel reinforcing shall be of stainless steel material in conformance with ASTM A276. Precast concrete or plastic supports shall be used for all exposed faces.
- .3 Precast mortar/ concrete blocks acceptable for support of the bottom layer of bars in slabs on grade shall have compressive strength higher than the required compressive strength of the concrete structure designed.
- .4 Masonry bricks, pebbles, metal, or wood pieces are not acceptable.
- .5 Chairs, Bolsters, Bar Supports, Spacers: where adjacent to exposed concrete surfaces and for epoxy-coated reinforcement, shall be of plastic type.

2.3 Storage and Handling

- .1 All bars shall be shipped in bundles appropriately tagged and identified with lot number, manufacturer, steel type, grade, bar mark, and designation, etc. Deliver, handle, and store concrete reinforcement in a manner to prevent damage, contamination with dirt or other materials and distortion.
- .2 Use padded bundling bands and multiple supports to prevent bar abrasion or contamination for galvanized bars, stainless steel bars, and epoxy-coated bars.
- .3 Reinforcing steel shall always be covered and protected during transportation and storage. Reinforcing steel of differing material types shall be stored separately on platforms, skids, or other suitable means to keep the material off the ground surface.
- .4 Store epoxy-coated bars away from long-term direct sunlight. Cover as required.
- .5 The surface finish shall be continuous, adherent, as smooth and evenly distributed as possible, and free from any defect detrimental to the stated end use of the reinforcement and coated article.
- .6 Coating adhesion shall withstand normal handling consistent with the nature and normal use of reinforcing bars.
- .7 Bar-to-bar abrasion and excessive sagging of bundles shall be prevented by using spreaders and non-metallic slings.

PART 3 EXECUTION

3.1 Fabrication

- .1 Fabricate reinforcing steel in accordance with latest edition of CSA S6, CSA A23.1 and Contract Drawings.
- .2 Galvanized coating applicator shall follow the procedures contained in the Quality Assurance Manual of the American Galvanizers Association. Safeguard against hydrogen embrittlement in conformance with ASTM A143.
- .3 The applicator for epoxy coating of reinforcing steel is to be certified under the CRSI Voluntary Certification Program for Fusion Bonded Epoxy Coating Applicator Plants.
- .4 Locate reinforcing splices not indicated on the Contract Drawings at points of minimum stress. Obtain the Departmental Representative's written approval of lap splice locations. Unless otherwise noted, provide tension lap splices, Class B.
- .5 All bars shall be cold bent at fabricator's shop. Minimum fabrication temperature to conform to CSA A23.1. Heating of bars to facilitate bending will not be permitted.
- .6 Bars shall be cut by shearing or with fluid cooled saws. Torch cutting of bars shall not be permitted.
- .7 Fabrication of stainless steel reinforcing bars shall be so that the surface of the stainless steel bars do not get contaminated with non-stainless steel ferrous deposits, dirt or oil, and are not damaged by straightening or bending.
- .8 Pins around galvanized and epoxy-coated reinforcing bars that are bent shall have a minimum diameter as follows:
 - .1 For 10M to 30M inclusive, 8 bar diameters.
 - .2 For 35M or greater, 10 bar diameters.
- .9 Fabricate to the Contract Drawings and to site-confirmed dimensions within the tolerances specified in Reinforcing Steel Institute of Canada (RSIC) Manual of Standard Practice (latest edition) unless specified otherwise.
- .10 Reinforcing steel that is to be hot dip galvanized shall be galvanized after fabrication.
- .11 Welding of reinforcing steel is not permitted without written approval of the Departmental Representative.
- .12 All surfaces of sheared ends of bars, as well as cracking and other visible damage or deterioration of the hot dip galvanizing as a result of handling or installation operations, or any other causes, shall be repaired with ZINGA or approved equal formulation, in accordance with ASTM A780M. All field-applied galvanized coatings shall be applied in accordance with the manufacturer's recommendations and as directed by the Departmental Representative. Repairs to the reinforcing bars shall be done prior to placing the bars in forms.
- .13 All epoxy-coated reinforcing bars are to be coated in the fabrication process with a primer or conversion coating to improve adhesion to epoxy.
- .14 Inspect epoxy coating visually for continuity after cure. Ensure coating is free from holes, voids, contaminants, cracks, and damaged areas.

- .15 All sheared ends, mechanical splices, welded splices, and damaged areas, as a result of handling or installation operations or any other causes, shall be coated with an approved repair material. Do not carry out repairs when the surroundings are less than 5°C or when moisture is present on bar.
- .16 Allow for additional quantity of regular, stainless steel, galvanized, and/or epoxy-coated reinforcing as determined in the Contract Documents.

3.2 Installation

- .1 Place reinforcing steel in accordance with CSA A23.1. Conform to recommendations of the American Galvanizers Association for installation and inspection of galvanized reinforcing.
- .2 Reinforcing steel shall be free from loose rust, scale, dirt, oil, paint, or other deleterious material. Stainless steel shall be pickled in shop to remove such foreign material or rejected.
- .3 Adequately support reinforcing and secure against displacement within the tolerances permitted.
- .4 Bars shall be tied at all intersections except when the bar spacing is less than 250 mm in each direction; alternate intersections may be tied at these locations.
- .5 Splicing of bars, unless shown on plans, shall not be allowed, unless approved by the Departmental Representative in writing. For lapped splices, the bars shall be placed in contact and wired together in such a manner as to maintain a clearance of not less than the required minimum clear distance to other bars, and the required distance to the concrete surface.
- .6 Contact points between stainless steel, galvanized and black reinforcing steel bars are to be separated by a non-conductive material such as rubberized pads, rubber hose rings, or polyethylene tape.
- .7 Distances from forms shall be maintained by means of spacers, chairs, or stays. Metal chairs shall not be used to support reinforcement on surfaces which are to be exposed or are to be finished; where possible, this reinforcement is to be supported entirely from above. Obtain approval of the Departmental Representative for use of spacers used at the exposed concrete surfaces.
- .8 Preferably, spacers for separating layers of reinforcing shall be precast concrete blocks.
- .9 Any metal chairs protruding through the surface of hardened concrete, where approved, shall be cut back at least 25 mm and the holes filled in accordance with Cast-in-Place Concrete Specification or High Performance Concrete Specification, as applicable, included in the Contract Documents.
- .10 Provide concrete cover to steel reinforcement of thickness indicated on the Contract Drawings.
- .11 Do not damage epoxy reinforcing steel by dropping, dragging, skidding, or supporting on abrasive materials. Contractor to inspect epoxy-coated reinforcement before and after placing.
- .12 Obtain written approval from the Departmental Representative prior to cutting of reinforcing to accommodate openings or embedded items. Allow for additional splice material which may be required to reinforce these cut bars as directed by the Departmental Representative.

- .13 Use plastic-sleeved concrete vibrators while placing concrete around epoxy-coated reinforcing.

3.3 Cleaning and Repair

- .1 Ensure all loose scale, loose rust, and other deleterious matter from surfaces of reinforcing is removed in a manner which is acceptable to the Departmental Representative.
- .2 Stainless steel reinforcing bars with any single area of iron contamination greater than 100 mm, two or more areas of contamination greater than 50 mm in length, or frequent small occurrences of contamination along the full length of the bar shall be cleaned, repaired, or replaced at the Contractor's expense.

PART 4 MEASUREMENT AND PAYMENT

4.1 Payment

All materials, labour, and equipment required to supply and install reinforcing steel will be considered incidental to the work. No separate payment will be made for this work.

END OF SECTION

PART 1 GENERAL

1.1 Work Included

- .1 Concrete repairs include removal of deteriorated concrete, preparation of damaged and deteriorated concrete surfaces, and application of new concrete materials to make the repair.
- .2 Surface preparation to receive repair materials including bonding agent as appropriate.
- .3 Formwork and reinforcing steel as required.
- .4 Application of repair materials as shown on the Contract Drawings or as specified elsewhere in the Contract Documents.
- .5 Curing, striping, and surface finishes.

1.2 Related Work

- | | | |
|----|-----------------------------------|------------------|
| .1 | Demolition | Section 02 07 00 |
| .2 | Concrete Formwork and Accessories | Section 03 10 00 |
| .3 | Concrete Reinforcement | Section 03 20 00 |

1.3 Environmental Constraints

- .1 Be aware of any site/operation-related environmental constraints.
- .2 Debris shall be contained and disposed of to an acceptable waste site.
- .3 Concrete or other repair materials shall not be allowed to enter into water channels or storm or sanitary sewer system.
- .4 Ensure sandblasting operations meet the environmental protection requirements.
- .5 Ensure satisfactory clean-up and landscape restoration.

1.4 Quality Assurance

- .1 The manufacturer's technical support, inclusive of the on-the-job service, shall be available for all products used under this Specification.
- .2 The manufacturer shall, upon request, issue product performance certificate indicating that their products conform to this Specification.

1.5 Examination of Work

- .1 Examine the drawings and visit the site to determine existing conditions. Notify the Departmental Representative, in writing, of any discrepancies between the information on the Contract Drawings and existing conditions.
- .2 Examine the existing as-constructed work. Notify the Departmental Representative, in writing, of any conditions which may prejudice proper completion of the work. Commencement of the work implies acceptance of existing conditions.
- .3 The Departmental Representative and Contractor shall jointly inspect and mark the extent of repair work.

- .4 The extent of repair work may be adjusted upon the removal of deteriorated concrete and examination of the condition by the Departmental Representative.

PART 2 PRODUCTS

2.1 Material Performance Standards

- .1 All materials shall be as specified on the Contract Documents, or as approved by the Departmental Representative.
- .2 Cementitious grout shall be a Portland cement-based product requiring only the addition of potable water for mixing or a polymer-modified cementitious compound.
- .3 Cementitious grout shall contain natural aggregates and shall be used for patches greater than 12 mm in depth.
- .4 Polymer grouts shall be used for patches less than 12 mm in depth.
- .5 Grout shall meet or exceed the strength requirements of 20 MPa in one day and 35 MPa in three days.

2.2 Product Installations

- .1 Product shall be packaged in moisture resistant bags or containers with the product name, lot number, and expiration date marked clearly on each package.
- .2 Each bag or container shall be accompanied by printed instructions indicating recommended instructions for proper use of the product.
- .3 Product shall be delivered without damage or contamination.
- .4 Product shall be stored and protected from damage or contamination.

2.3 Acceptable Materials

- .1 All materials shall be subject to the review of the Departmental Representative
- .2 All products shall be currently approved by Alberta Transportation.
- .3 Complete concrete work in accordance with Section 4 "CAST IN PLACE CONCRETE" of the Alberta Transportation Standard Specifications for Bridge Construction, Edition 16, 2017 (SSBC).

SSBC may be downloaded from the Alberta Transportation website at the following link:

<http://www.transportation.alberta.ca/Content/docType246/Production/StandardSpecificationsforBridgeConstruction2017.pdf>.

- .4 Crack repair Products:
 - .1 Gravity flow concrete crack filler shall be from Alberta Transportation's Product List/Crack Treatment/Concrete Crack Filler/Proven Products and have a viscosity less than 105 centipoises (cP).
 - .2 Epoxy for Crack Injection: Viscosity less than 500 cP, meet ASTM C881 Type IV, Grade 1, Class B or C. Sikadur 35 Hi-Mod LV/ Sikadur 31 Hi-Mod Gel Crack Filler/ Cap Seal or approved equal for injection of non-horizontal cracks.

- .5 Sealer:
 - .1 Type 1c Concrete Sealer – Products currently approved by Alberta Transportation.
- .6 Pigmented Sealer:
 - .1 Type 3 Pigmented Sealers - Products currently approved by Alberta Transportation.
 - .2 Pigmented sealer to be concrete grey.
 - .3 Sealer shall be applied to maximized coverage of the piers. Low water for the Bow River in this location typically occurs in September. See <https://rivers.alberta.ca/>, station 05BA001 for typical water levels.
- .7 Other products may be used subject to review and approval by the Departmental Representative.

2.4 Equipment

- .1 Power-driven hand tools for removal of concrete will be permitted for areas shown on the Contract Drawings unless specified otherwise with the following restrictions:
 - .1 Jack hammers heavier than nominal 14 kg class and chipping hammers heavier than normal 7 kg class shall not be used to remove concrete.
 - .2 Mechanical scrabblers not to exceed 8 Nm (6 ft/lb) impact.
 - .3 Grinders or shotblasting, capable of removing the concrete and producing an angular finished surface.
 - .4 Concrete cutting saws capable of sawing to the depths indicated on the Contract Drawings.
- .2 As an alternate, other equipment may be used for concrete removal upon approval from the Departmental Representative, if it can be demonstrated that the method will not damage overlying and/or underlying or adjacent concrete elements.
- .3 Hand tools such as hammers and chisels.

PART 3 EXECUTION

3.1 Surface Preparation

- .1 Clearly mark the extent of concrete removal areas as identified by the Departmental Representative and Contractor during the examination.
- .2 Within designated areas, concrete shall be removed to obtain a minimum of 20 mm clearance around visibly corroded or debonded reinforcement or reinforcement with greater than half its cross section exposed.
- .3 Minimum depth of concrete removal shall be as specified on the Contract Drawings and in the Specifications or as directed by the Departmental Representative.
- .4 Upon exposure of visibly corroded or debonded reinforcement, additional concrete removal shall be performed until bars appear to be rust-free or until otherwise directed by the Departmental Representative.

- .5 Outline patch area with a 13 mm deep vertical sawcut as close as possible to limits of concrete already removed. Reduce sawcut depth if necessary to avoid cutting reinforcement. Remove concrete to sawcut taking precautions to avoid damaging sawcut edge. Edges with spalls or chips will be rejected and shall be re-sawcut at Contractor's expense.
- .6 Care shall be taken to prevent damage to existing steel reinforcing.
- .7 Additional reinforcing steel shall be installed at all locations where the existing reinforcing steel has suffered cross section loss greater than 20%, or as determined by the Departmental Representative.
- .8 Remove all defective concrete, laitance, dirt, oil, grease, and other foreign materials from concrete surfaces by hammer chipping, as required, until a sound, clean, roughened concrete surface is achieved.
- .9 Remove all rust from reinforcing by sandblasting.
- .10 Prepare surfaces to be repaired in conformance with product manufacturer's recommendations and this Specification.
- .11 Roughen surface to ICRI Standard CSP7 to ensure proper bond.
- .12 Prior to erection of formwork, all surfaces shall be washed with high-pressure washer.
- .13 The temperature of the material to which the grout is to be placed shall be between 5°C and 25°C. Use heating or cooling procedures as required to stay within this temperature range. Maintain this temperature range for a minimum period of 24 hours prior to, during, and 72 hours after application.

3.2 Zinc Anodes

- .1 After surface preparation exposed reinforcing bar shall then be protected by the installation of discrete galvanic anodes installed at a minimum of 1 anode per 300 mm of perimeter of the patched area.
- .2 Galvanic anodes shall be a product selected from those listed on the Alberta Transportation Product List of Galvanic Corrosion Protection.
- .3 Anodes shall be embedded in low resistivity mortar and shall have the same concrete cover as the reinforcing steel.

3.3 Formwork

- .1 Form shall be water tight and caulked if necessary to prevent seepage.
- .2 Construct formwork accurately, ensuring grout conforms to lines, levels, and dimensions indicated on drawings.
- .3 Arrange and assemble formwork to permit easy dismantling and stripping, ensuring grout is not damaged during its removal.
- .4 Provide sufficient clearance for proper placement between formwork and area being repaired.
- .5 Cover form surfaces with an acceptable release coating.

3.4 Inspection

- .1 The Departmental Representative's approval of surface cleaning and preparation is required prior to proceeding with concrete/grout placement. Notify the Departmental Representative prior to placing repair material to conduct the inspection. Implement all requirements resulting from the inspection prior to proceeding to the installation of repair material.
- .2 Provide samples of product to the Departmental Representative on request for testing and inspection.

3.5 Mixing of Flowable Grout

- .1 Mix the grout in accordance with the manufacturer's instructions and this Specification.
- .2 Adequate mixing capacity shall be on-site to ensure rapid, continuous, and uninterrupted placement. A standby mixer is recommended.
- .3 Mix close to the pour location and limit transportation and placement time to 10 minutes. Transport the grout to prevent segregation.
- .4 Do not mix more grout than can be placed in 10 minutes.
- .5 Mixed grout temperature shall be between 5°C and 25°C using ice or warm water (not to exceed 30°C) to maintain the proper mixed temperature.
- .6 No re-tempering shall be permitted once the grout is mixed.
- .7 Mix the grout until it is homogeneous in colour.
- .8 Upon completion of all formwork, and just prior to placing repair material, pre-wet patch surfaces. It is intended that the prepared surfaces be in a dry condition before the concrete is placed.
- .9 Apply an approved bonding agent, in accordance with the manufacturer's recommendations, prior to grouting, to all areas being patched, as well as any exposed reinforcing steel.

3.6 Supply of Concrete

- .1 When a truck mixer or agitator is used for transporting concrete, the concrete shall be delivered to the work site and discharge shall be completed within one and one-half (1½) hours after the introduction of the mixing water to the cement and aggregates (otherwise known as batch time). If the concrete has not been discharged within 1½ hours from batch time, the concrete shall be retested for slump, air, and compressive strength. The concrete shall be rejected if any of the mix properties do not conform to the specified requirements.
- .2 No water shall be added to the concrete mixture on-site.
- .3 No chemical admixtures shall be added to the concrete mixture after one hour from batch time.
- .4 At no time will the concrete be accepted if the discharge has not been completed within two hours from the batch time.

3.7 Placing Flowable Grout and Concrete

- .1 Place flowable grout/concrete in areas designated by the Departmental Representative.

- .2 Grout/concrete shall be placed from one side only allowing the grout to push air ahead and out as the space is filled. Placing should be rapid and continuous.
- .3 Do not vibrate grout.
- .4 Grout/concrete deep depressions first.
- .5 Abide by the requirements of CSA CAN3-A23.1 regarding cold weather conditions and this Specification.

3.8 Protection and Curing

- .1 Keep the grout/concrete from freezing for at least seven days.
- .2 Do not remove forms until after final set.
- .3 Allow the Departmental Representative to inspect concrete surface immediately after removal of forms.
- .4 Any imperfections shall be repaired at once before the grout/concrete is thoroughly dry. Imperfections shall be repaired in accordance with this Specification herein or as indicated on the Contract Drawings to the approval of the Departmental Representative.
- .5 Immediately following removal of forms, all fins and irregular projections shall be removed from all surfaces.
- .6 After stripping the forms, cure all exposed grout surfaces in conformance with the manufacturer's recommendations.

3.9 Concrete Finishing

- .1 After placing, concrete shall be finished as per the relevant sections of Clause 22 of CAN/CSA A23.1. Excess finishing is to be avoided. No plaster coat will be allowed. Adding water to the surface of the concrete to assist with finishing will not be allowed.
- .2 The Contractor shall always have available material to protect the surface of the plastic concrete from damage from the rain. The materials shall consist of burlap, cotton mats, waterproof paper, or plastic sheeting. Protection shall be employed when rain, sufficient to mar the texture of the concrete surface, is expected. The decision of the Departmental Representative in this regard shall be final.
- .3 The Contractor is responsible to ensure the surface of the concrete is not vandalized during set-up. Any damaged surface must be repaired, or replaced, to the satisfaction of the Departmental Representative.
- .4 Floated Surface Finish:
 - .1 Strike off the compacted concrete to the cross section and elevation shown on drawings. Keep an excess of concrete in front of screed at all times.
 - .2 Obtain a uniform surface by floating as necessary. If floating is not completed before excess water appears at the surface, remove this water before continuing with floating.
 - .3 Add or remove concrete during floating, as required, to obtain a surface with no more than 3 mm deviation from the required surface in any 3 m length.

- .4 Do not overwork concrete surface. Float only enough to obtain a dense uniform surface.
- .5 Trowelled Finish:
 - .1 After completion of floating surface, trowel to produce a dense smooth finish.
- .6 Surface Hardener:
 - .1 Apply according to manufacturer's instructions in conjunction with floating operations.
- .7 Curing Compound:
 - .1 For exposed concrete, a curing compound shall be uniformly sprayed, applied immediately on completion of finishing surface in accordance with manufacturer's instructions.

3.10 Concrete Curing

- .1 As soon as practical, after the texturing operation is complete, the entire pavement surface, including exposed sides, shall be cured by protecting it against loss of moisture, rapid temperature change, and mechanical injury, in accordance with the requirements of CSA A23.1.
- .2 The Contractor shall be responsible for taking all necessary measures to protect freshly placed concrete from adverse weather conditions, including hot weather, wind, rain, sleet, snow, and cold weather, to the satisfaction of the Departmental Representative. Concrete shall be adequately protected in accordance with the requirements specified in CAN/CSA-A23.1.
- .3 When Polyethylene film sheets (light coloured) or waterproof paper sheets are used, the sheets shall be long enough to cover the entire width and edges of the section and shall be lapped a minimum of 300 mm at joints. The sheets shall be adequately restrained to prevent displacement or billowing due to wind.
- .4 When white liquid membrane forming curing compounds as per ASTM 309-07 are employed, the compound shall be applied to exposed surface and edge of the concrete section following the final texturing operation, after all free bleed water has evaporated or been removed from the surface. Complete and uniform coverage, at a rate of 3 to 4 m²/L shall be required. The compound shall be agitated to prevent pigment from settling.
- .5 If the curing compound method of curing is used in combination with sawn control joints, provisions shall be made to cure and protect the exposed faces of the cleaned joint.
- .6 When concrete has been placed in cold weather and the air temperature is expected to drop below 5°C, then polyethylene sheets, insulated curing blankets or other suitable material shall be placed beside the concrete members. Whenever the temperature is expected to reach the freezing point, during the day or night, the protective material shall be spread over the concrete surface and weighted to prevent movement to protect the concrete from freezing. Curing shall continue until the cumulative number of days, not necessarily consecutive, or fraction thereof, during which the temperature of the air in contact with the concrete is above 10°C, has totalled a minimum of seven days. Alternatively, if compressive test of cylinders cured under field conditions achieve at least 70% of the specified compressive strength, curing may be discontinued.

- .7 Concrete placed in cool weather shall experience a minimum 30-day air drying period, following final curing, before the first application of de-icing salts.
- .8 Concrete damaged as a result of inadequate protection against weather conditions, in the sole opinion of the Departmental Representative, shall be removed and replaced by the Contractor at his own expense.

3.11 Mixing Dry Pack Grout

- .1 Mix grout in accordance with manufacturer's recommendations and this Specification.
- .2 Adequate mixing capacity shall be on-site to ensure rapid, continuous, and uninterrupted placement. A standby mixer is recommended.
- .3 Mix close to the pour location and limit transportation and placement time to 10 minutes. Transport the grout in an effort to prevent segregation.
- .4 Do not mix more grout than can be placed in 10 minutes.
- .5 Mixed grout temperature shall be between 5 and 25°C using ice or warm water (not to exceed 25°C) to maintain mixed temperature.

3.12 Placing Dry Pack Grout

- .1 Place dry pack grout where designated by the Departmental Representative in conformance with manufacturer's recommendations and this Specification.
- .2 Apply an approved bonding agent, in accordance with manufacturer's recommendations prior to grouting, to all areas to be patched as well as all exposed reinforcing steel.
- .3 Place grout in conformance with manufacturer's recommendations and this Specification.
- .4 Trowel finish the surface of the patch to the correct profile.
- .5 Repair any imperfections with this Specification.
- .6 Cure the patched area in conformance with manufacturer's recommendations.

3.13 Field Quality Control

- .1 Testing of repair materials may be completed by an independent testing agency retained and paid for by the Owner.
- .2 The Contractor is to provide access for all testing and inspections.
- .3 The Contractor shall provide patching materials from field batches for the casting of test cubes, as required.
- .4 All re-testing shall be at the Contractor's expense.
- .5 Materials not meeting these Specifications shall be replaced at the Contractor's expense.

3.14 Disposal

- .1 Dispose of concrete and other debris from the site.

3.15 Use of Fibre Reinforced Polymers Materials

- .1 Fibre Reinforced Polymers (FRP) materials, if specified, shall be applied to sound concrete.
- .2 Wide cracks and spalls shall be repaired prior to application of FRP material.
- .3 Due to the wide variety of material types and applications, the Specifications for FRP materials shall be performance-based and shall be included on the Contract Drawings.

PART 4 FINAL INSPECTIONS AND ACCEPTANCE

4.1 Inspection

- .1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Departmental Representative including all operations from the selection and production of materials through final acceptance of the specified work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Departmental Representative reserves the right to reject any materials or works which are not in accordance with the requirements of this Specification.

4.2 Access

- .1 The Departmental Representative or a designate shall be afforded full access for the inspection and control testing of concrete and constituent materials, both at the work site and at any plant used to produce concrete, to determine whether the concrete is being supplied in accordance with this Specification.

4.3 Compressive Strength

- .1 Payment adjustments for compressive strength are as follows:

Average Compressive Strength	Payment Adjustment Factor
Compliant or greater	1.00
34.0 MPa to 34.9 MPa	0.95
33.0 MPa to 33.9 MPa	0.90
Below 33.0 MPa	Reject (Note 1)

Note 1: Subject to removal and replacement at the discretion of the Departmental Representative.

4.4 Air Content

- .1 Payment adjustments for air content are as follows:

Average Air Content	Payment Adjustment Factor
5% or greater	1.00
4.59% - 4.9%	0.90
4.09% – 4.4%	0.80
Below 4.0%	Reject (Note 1)

Note 1: Subject to removal and replacement at the discretion of the Departmental Representative.

4.5 Final Acceptance

- .1 In the event where the compressive strength of the test cylinders, low air entrainment, deficient slump, improper compaction of the concrete base, poor finishing or crossfall, trueness of surfaces, elevation and alignment tolerances for any portion of the work does not meet the requirements specified herein, the Owner and its representatives, at their discretion, may require that the portion(s) deemed deficient be completely removed and replaced at the expense of the Contractor.

END OF SECTION

PART 1 GENERAL

1.1 Governing Specifications

- .1 Complete joint replacement work in accordance with Section 6 "STRUCTURAL STEEL" of the Alberta Transportation Standard Specifications for Bridge Construction, Edition 16, 2017 (SSBC).
- .2 SSBC may be downloaded from the Alberta Transportation website at the following link:
<http://www.transportation.alberta.ca/Content/docType246/Production/StandardSpecificationsforBridgeConstruction2017.pdf>.

1.2 Basic Requirements

- .1 Structural steel shall conform to CSA G40.21-300W and be hot-dip galvanized unless noted otherwise.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not Used.

PART 3 EXECUTION

3.1 Not Used

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 Governing Specifications

- .1 Provide traffic signage in accordance with Specification 5.18 "Supply of Permanent Highway Signs, Posts and Bases" of the Alberta Transportation Standard Specifications
- .2 SSHC may be downloaded from the Alberta Transportation website at the following link:

http://www.transportation.alberta.ca/images/Standard_Specifications_for_Highway_Construction_2013.pdf

1.2 Basic Requirements

- .1 All signs shall be aluminum

PART 2 PRODUCTS

2.1 Not Used

- .1 Not Used.

PART 3 EXECUTION

3.1 Not Used

- .1 Not Used.

END OF SECTION