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DRAWINGS:

001	COVER SHEET, DRAWING LIST & LOCATION MAP
002	GENERAL ARRANGEMENT AND GENERAL NOTES
003	FOUNDATION LAYOUT
004	ABUTMENTS
005	PIER
101	BRIDGE REPLACEMENT GENERAL ARRANGEMENT
102	MAIN SPAN TRUSS FABRICATION DETAILS

REFERENCE DRAWINGS:

NONE.

SECTION 01 11 00 SUMMARY OF WORK

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 14 00 - Work Restrictions.
- .2 Section 01 29 01 - Site Occupancy.
- .3 Section 01 33 00 - Submittal Procedures.
- .4 Section 01 35 00.06 - Special Procedures for Traffic Control.
- .5 Section 01 35 33 - Bridge Rehabilitation Special Procedures.
- .6 Section 01 35 43 - Environmental Procedures.

1.2 REFERENCES

- .1 Not used.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work for this Contract comprises the replacement of the Spray River End of Loop Bridge, located south of the Banff Townsite approximately 6Km from the trailhead in Banff National Park, Alberta.
- .2 Preparation of an "Environmental Protection Plan" (EPP).
 - .1 In preparation for and during replacement of the Spray River Trail Bridge No. 1, an "Environmental Protection Plan" (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 minimal adverse effects are achieved. The Contractor's EPP must be approved by the Departmental Representative on behalf of Parks Canada Agency (PCA) 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.
- .3 Without limiting the scope of the Work, the Work for this Contract generally comprises the following:
 - .1 Mobilization and site preparation.
 - .2 Demolition and removal of existing abutments.
 - .3 Supply and installation of new bridge substructure and approach ramp foundation. Substructure construction includes installation of rock dowels.
 - .4 Fabrication, supply and installation, and transportation by helicopter of new aluminium truss pedestrian bridges and approach span.
 - .5 Construction of approach ramps and realignment of existing gravel trails as required to tie into new bridge alignment.
 - .6 Demobilization

1.4 CONTRACT METHOD

- .1 Construct Work under combined price contract.

1.5 WORK BY OTHERS

- .1 Where it is necessary that work is to proceed in areas of this project common to both the Contractor and forces of others, the Contractor shall cooperate with the other Contractors, sharing his work space, and shall coordinate his operations with the other Contractors.

1.6 CONSTRUCTION ORGANIZATION AND START-UP

- .1 Within seven (7) days after award of Contract, a meeting of parties in the Contract will be called by the Departmental Representative to discuss and resolve administrative procedures and responsibilities.
 - .1 Senior representatives of the Owner, the Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.
 - .2 Agenda to include following:
 - .1 Appointment of official representative of participants in Work.
 - .2 Work Schedule.
 - .3 Requirements for temporary facilities, offices, storage sheds, utilities, fences.
 - .4 Site safety and security in accordance with Section 01 14 00 - Work Restrictions and Section 01 35 43 - Environmental Procedures.
 - .5 Quality Management Plan in accordance with Section 01 45 00 - Quality Management.
 - .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
 - .7 Monthly progress claims, administrative procedures, photographs, and holdbacks.
 - .8 Schedule of submissions.
 - .9 Insurances and transcript of policies.
 - .2 Comply with The Departmental Representative's allocation of mobilization areas of site; for field offices and sheds, for access, traffic, parking, and sanitary facilities.
 - .3 Comply with instructions of the Departmental Representative for use of temporary utilities and construction facilities.
 - .4 Coordinate field engineering and layout work with the Departmental Representative.
 - .5 During course of Work prior to project completion, attend biweekly progress meetings as scheduled by the Departmental Representative.
 - .6 The cost of attending meetings will be considered incidental to the Unit Price items and no additional payment will be made.

1.7 WORK SCHEDULE

- .1 Schedule Work progress to accommodate Owner/Departmental Representative's unrestricted access to inspect all phases of the Work.
- .2 Required stages:
 - .1 Substructure and approaches shall be completed by 2013 October 31.
 - .2 Substantial Performance by 2013 December 15.

- .3 Final Completion by 2013 December 31.
- .3 Work shall be carried out in accordance with Section 01 14 00 - Work Restrictions and Section 01 35 43 Environmental Procedures.
- .4 Submit detailed Project Schedule to include the following milestones and activity types:
 - .1 Award.
 - .2 Submittal of Shop Drawings
 - .3 Other Submittals.
 - .4 Material Fabrication.
 - .5 Mobilization(s).
 - .6 Environmental Protection Plan, review and implementation.
 - .7 Health and Safety Plan, review and implementation.
 - .8 Quality Management Plan, review and implementation.
 - .9 Abutment and Pier construction stages including concrete placement dates
 - .10 Truss In-shop inspection
 - .11 Truss installation date
 - .12 Completion of all remaining site works
 - .13 Demobilization(s)
- .5 During progress of Work revise and resubmit schedule as directed by the Departmental Representative.
- .6 In addition to the project schedule, submit weekly schedules to the Departmental Representative showing Work planned for the following week on a day by day basis

1.8 CONTRACTOR USE OF PREMISES

- .1 Contractor has unrestricted use of site, subject to Section 01 14 00 - Work Restrictions until Substantial Completion.
- .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 The Contractor and any Subcontractors shall obtain a business license from the Parks Canada Administration Office in Banff, prior to commencement of the contract.
- .5 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 at Parks Canada Administration Office in Banff.
- .6 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.
- .7 At completion of operation condition of existing work: equal to or better than that which existed before new work started.

1.9 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.10 CONSTRUCTION SIGNAGE

- .1 No signs or advertisements, other than warning signs, are permitted on site.
- .2 Signs and notices for safety and instruction shall be in both official languages. Graphic symbols shall be diamond grade and shall conform to CAN3-Z321.
- .3 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by the Departmental Representative.
- .4 Signage shall be coordinated with other Contractors.

1.11 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
 - .1 Environmental Protection Plan (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 Copy of Approved Work Schedule.
 - .11 Health and Safety Plan and Other Safety Related Documents.
 - .12 Quality Management Plan
 - .13 Other documents as specified.

1.12 CLOSEOUT PROCEDURES

- .1 Notify the Departmental Representative when Work is considered ready for Substantial Performance.
- .2 Accompany the Departmental Representative on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with the Departmental Representative's instructions for correction of items of Work listed in executed certificate of Substantial Performance and those determined in the final inspection.
- .4 Notify the Departmental Representative of completion of items of Work listed in executed certificate of Substantial Performance and those determined in the final inspection.

Part 2 Products

.1 Not used.

Part 3 Execution

.1 Not used.

END OF SECTION

SECTION 01 14 00 WORK RESTRICTIONS

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 11 00 - Summary of Work.
- .2 Section 01 31 00 - Project Management and Coordination.
- .3 Section 01 35 14 - Special Procedures for Traffic Control.
- .4 Section 01 35 33 - Special Procedures for Bridge Rehabilitation.
- .5 Section 01 35 43 - Environmental Procedures.
- .6 Section 01 56 00 - Temporary Barriers and Enclosures.

1.2 ACCESS AND EGRESS

- .1 Access to the site is limited due to its backcountry location. Access with side by side quad ATV and trailer or mini-excavator equivalent in size to a John Deer 60G or smaller is available to both banks. Transportation by helicopter is anticipated for larger structural components.

1.3 USE OF THE WORK SITES

- .1 The Work Sites shall be specified by the Departmental Representative and shall only be used for the purposes of the Work. The Work Sites will be made available by Parks Canada to the Contractor for its non-exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.
- .2 While the Work Sites are under the Contractor's control, the Contractor shall be entirely responsible for the security of the Work Sites and of the Work, and for the security of the work of Other Contractors located on the Work Sites.
- .3 The Contractor shall keep the Work Sites clean and free from accumulation of waste materials and rubbish regardless of source. Snow shall be removed by the Contractor as necessary for the performance and inspection of the Work.
- .4 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .5 The Contractor will not be permitted to establish a worker's accommodation camp inside Banff National Park.
- .6 Office/tool trailer and compound may be set up at the trail head at a location approved by the Departmental Representative.
- .7 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep area and premises in sanitary condition.
- .8 Any damage to the Work Sites caused by the Contractor shall be repaired by the Contractor at its expense.
- .9 The work must be performed during daylight hours, from 7:00 to 22:00 hours, seven days per week, unless authorized in writing by the Departmental Representative.

1.4 SNOW CLEARING OF TRAILS

- .1 Snow clearing necessary for the completion of the work will be the responsibility of the Contractor.
- .2 Contractor to submit a plan identifying the frequency, method and equipment proposed for snow clearing for approval by the Departmental Representative.

1.5 UTILITIES

- .1 There no known utilities at the site.

1.6 SURVEY OF EXISTING SITE CONDITIONS

- .1 Submission of a tender is deemed to be confirmation that the Contractor has inspected the site and is completely familiar with all conditions or restrictions affecting execution and completion of the work.
- .2 The Contractor shall regularly monitor the condition of the Work Site throughout the construction period.
- .3 The Contractor shall monitor river flows and ensure construction work is protected from high flows at all times.

1.7 DEMOLITION AND DISPOSAL OF EXISTING ABUTMENTS

- .1 Contractor is required to demolish, remove and dispose of site the existing reinforced concrete abutments. The following is brought to the Contractor's attention:
 - .1 The existing south abutment is within the work zone of the new south abutment thus will need to be removed prior to construction of new abutment. Details of connection to bedrock are unknown, Contractor to assume some steel dowels will be present, to be exposed and cut flush with bedrock.
 - .2 The north abutment has been washed some distance downstream and is currently within the wetted perimeter of the river. The Contractor will be permitted to saw-cut the reinforced concrete into smaller more manageable pieces in-stream for removal. Appropriate fencing and filters should be in place to prevent pieces of deleterious materials entering the river system.

1.8 PROTECTION OF PERSONS AND PROPERTY

- .1 The Contractor shall comply with all applicable provincial safety regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations.
- .2 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or adjacent to the Work Site to the extent that may be affected by conduct of work.
- .3 The Contractor shall promptly take such measures as are required to repair, replace or compensate for any loss or damage caused by the Contractor to any property or, if Parks Canada so directs, shall promptly reimburse to Parks Canada the costs resulting from such loss or damage.

1.9 USE OF PUBLIC AREAS

- .1 The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas.

- .2 All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle.
- .3 All vehicles arriving at or leaving the Work Site and transporting materials shall be loaded in a manner which will prevent dropping of materials or debris on the roadways, and where contents may otherwise be blown off during transit such loads shall be covered by tarpaulins or other suitable covers. Spills of materials in public areas shall be removed or cleaned immediately by the Contractor at its own expense.
- .4 All activities shall be in accordance with Section 01 35 43 - Environmental Procedures and the Environmental Protection Plan prepared for the project.

1.10 SUPERVISORY PERSONNEL

- .1 Within five Days after award notification, the Contractor shall submit to the Departmental Representative confirmation of the names of the supervisory personnel and other key staff designated for assignment on the Contract.

The following personnel shall be included in the list:

- .1 Project Superintendent;
 - .2 Deputy Project Superintendent;
 - .3 Health and Safety Coordinator.
- .2 The Project Superintendent shall be employed full time and shall be present on the Work Site each and every workday that Work is being performed, from the commencement of Work to Total Performance of the Work.
 - .3 The Project Superintendent shall nominate a Deputy Project Superintendent who shall have the authority of the Project Superintendent during the Project Superintendent's absence.
 - .4 Health and Safety Co-ordinator must:
 - .1 Have minimum 2 years site related working experience specific to activities associated with roadway construction.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety training sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of the Project Superintendent.

1.11 MEETINGS

- .1 The Work includes attending meetings between the Contractor and the Departmental Representative. The meetings will be called and chaired by the Departmental Representative as required. The Contractor shall be represented at such meetings to the satisfaction of the Departmental Representative.
- .2 The Departmental Representative will schedule an initial meeting to be held on site after award notification. This meeting shall be attended by senior representatives of the

Owner, the Departmental Representative, Contractor, major subcontractors and field inspectors.

- .3 Progress and status meetings will be held on a bi-weekly basis or more frequently as directed by the Departmental Representative.
- .4 Cost of attending the above meetings shall be considered incidental to the Unit Price items and no additional payment will be made.

1.12 WASTE DISPOSAL

- .1 Refer to Section 01 35 43 - Environmental Procedures.
- .2 All surplus, unsuitable and waste materials shall be removed from the job site to approved sites outside Banff National Park unless specified otherwise in other sections of these Specifications.
- .3 Deposits of any construction debris into any waterway are strictly forbidden.
- .4 Cost for waste disposal described above shall be considered incidental to the Work and no additional payment will be made.

1.13 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

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

SECTION 01 25 20 MOBILIZATION AND DEMOBILIZATION

Part 1 General

1.1 DESCRIPTION

- .1 Mobilization and Demobilization consists of preparatory work and operations including but not limited to, those necessary for the movement of personnel, equipment, camp, buildings, shops, offices, supplies and incidentals to and from the project site.
- .2 Any protective measures or movement of Contractor trailers necessitated by animal interactions and required by Parks Canada will be paid by the Departmental Representative, and are not to be anticipated in the Lump Sum Contract Price for Mobilization and Demobilization.
- .3 For the purposes of mobilization and demobilization, "project site" means the bridge site location and/or the trailhead site compound.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

- .1 The measurement and payment procedure for Mobilization and Demobilization shall meet the requirements in Section 01 29 00 Payment Procedures.

END OF SECTION

SECTION 01 29 00 PAYMENT PROCEDURES

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - Summary of Work.
- .2 Section 01 14 00 - Work Restrictions.
- .3 Section 01 25 20 - Mobilization and Demobilization.
- .4 Section 03 10 00 - Concrete Forming and Accessories.
- .5 Section 03 20 00 - Concrete Reinforcing.
- .6 Section 03 30 00 - Cast-In-Place Concrete.
- .7 Section 05 12 33 - Steelwork.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

- .1 All work required to complete the Work shall be included in the Lump Sum Arrangement. No measurement or payment will be made for work considered incidental to this contract unless the Departmental Representative certifies that such extra expense is directly attributable to unforeseeable deterioration or existing condition of the existing structure substantially different than that indicated by the drawings and specifications.
- .2 The Work completed under the Lump Sum Arrangement shall include, but not be limited to, the following tasks as listed in the Lump Sum Price Breakdown:
 - .1 **Mobilization and Demobilization**
 - .1 Mobilization and Demobilization consists of preparatory work and operations including but not limited to, those necessary for the movement of personnel, equipment, buildings, shops, offices, supplies and incidentals to and from the project site.
 - .2 Any protective measures or movement of Contractor trailers necessitated by animal interactions and required by Parks Canada will be paid by the Departmental Representative, and are not to be anticipated in the Lump Sum Contract Price for Mobilization and Demobilization.
 - .3 Mobilization and Demobilization:
 - .1 Payment shall be made under "Lump Sum Price Item 1 – Mobilization / Demobilization".
 - .2 50% of Lump Sum Contract Price for Mobilization and Demobilization to be paid when mobilization to site is complete.
 - .3 The remainder of the Lump Sum Price for Mobilization and Demobilization to be paid when work is complete and all materials, equipment, camp, buildings, shops, offices, and other facilities have been removed from site and site cleaned and left in condition to the satisfaction of the Departmental Representative and all other Agencies having Jurisdiction.
 - .4 Payment of only 5% of the total price tendered will be scheduled as outlined above. If the amount bid for Mobilization and Demobilization is greater than 5% of the total price tendered,

payment of the remainder of the amount will be authorized when the contract has been completed.

- .2 **Demolition, Removal and Disposal of Existing Bridge Abutments** includes all costs of labour, materials, equipment, tools, environmental requirements, safety requirements, submittals and associated Work required to demolish, remove, haul, and properly dispose of the existing bridge abutments. Payment will be as per the lump sum price in the Lump Sum Price Breakdown, pro-rated by the portion of the demolition Work completed and as accepted by the Departmental Representative..
- .3 **Supply and Construction of new Reinforced Concrete Abutments** includes all costs of labour, materials, equipment, tools, temporary works, environmental requirements, safety requirements, quality control testing, submittals, curing, heating, hoarding, surface finishing and associated works required for the supply and construction of reinforced concrete abutments with wing walls as shown on the drawings. Payment will be as per the lump sum price in the Lump Sum Arrangement Table, pro-rated by the portion of the Work acceptably completed and as accepted by the Departmental Representative.
- .4 **Supply and Construction of new Pier Foundations and Steel Bent** includes all costs of labour, materials, equipment, shipping, helicopter transportation, tools, temporary works, environmental requirements, safety requirements, quality control testing, submittals and associated works required for the supply and construction of reinforced concrete foundations and steel bent. Payment will be as per the lump sum price in the Lump Sum Arrangement Table, pro-rated by the portion of the Work acceptably completed and as accepted by the Departmental Representative.
- .5 **Fabrication of Aluminum Trusses** includes all costs of labour, materials, equipment, tools, safety requirements, quality control testing, preparation of shop drawings, and associated works required for the fabrication of aluminium truss bridges and appurtenances including rubber matting. Payment will be as per the lump sum price in the Lump Sum Price Arrangement Table, pro-rated by the portion of the Work acceptably completed and as accepted by the Departmental Representative.
- .6 **Transportation and Installation of Aluminum Trusses** includes all costs of labour, materials, shipping, helicopter transportation, equipment, fuel, tools, access, falsework, environmental requirements, safety requirements, and associated Works required for the transportation from the fabrication shop and installation of the aluminium truss spans. Payment will be as per the lump sum price in the Lump Sum Price Breakdown.
- .7 **Realignment/construction of approach trail and backfill of new abutments** includes all costs of labour, materials and equipment required for the sourcing, testing, transportation, placement and compaction of locally sourced granular material for the realignment of trail approaches and backfill of abutments up to wearing surface elevation. Payment will be as per the lump sum price in the Lump Sum Price Arrangement Table, pro-rated by the portion of the Work acceptably completed and as accepted by the Departmental Representative.
- .8 **Supply and Installation of Steel Bicycle Railing**, includes all costs of labour, materials, equipment, tools, environmental requirements, safety requirements, submittals and associated Works required to supply, fabricate and install new

steel bicycle railing as shown on the drawings. Payment will be as per the lump sum price in the Lump Sum Price Breakdown.

Part 2 **Products**
 .1 **Not Used.**

Part 3 **Execution**
 .1 Not Used.

END OF SECTION

SECTION 01 33 00 SUBMITAL PROCEDURES

Part 1 General

1.1 SECTION INCLUDES

- .1 Administrative.
- .2 Shop drawings and product data.
- .3 Certificates and transcripts.
- .4 Required Contractor Submittals.
 - Pre-mobilization Submittals
 - .1 Lump Sum Price Items breakdown.
 - .2 List of subcontractors and suppliers
 - .3 Schedule in Microsoft Projects and paper document format.
 - .4 Contractor Chain of Command.
 - .5 Work Plan.
 - .6 Quality Control Plan.
 - .7 Site Access Plan (including access scaffolding and work platforms).
 - .8 Environmental Protection Plan (EPP).
 - .9 Emergency Procedures Protocol.
 - .10 Health and Safety Plan.
 - .11 Materials Safety Data Sheets.
 - .12 Medical surveillance.
 - .13 On-site contingency and emergency response plan.
 - Construction Phase Submittals
 - .14 Weekly Progress Reports.
 - .15 Quality Control/Quality Assurance Inspection Reports.
 - .16 Shop Drawings.
 - .17 Progress Photographs.
 - .18 Copies of Contractor Health and Safety Inspection Reports.
 - .19 Copies of Federal or Provincial Safety Inspector Reports or Directions.
 - .20 Copies of Incident or Accident Reports
 - Project Completion Submittals
 - .21 Record Drawings.
 - .22 Quality Control/Quality Assurance Record

1.2 RELATED SECTIONS

- .1 Section 01 14 00 - Work Restrictions.
- .2 Section 01 35 33 – Bridge Replacement Special Procedures.
- .3 Section 01 35 43 - Environmental Procedures.

- .4 Section 01 78 00 - Closeout Submittals.
- .5 Section 03 20 00 - Concrete Reinforcing.
- .6 Section 03 30 00 - Cast-In-Place Concrete.
- .7 Section 05 12 33 - Steelwork

1.3 REFERENCES

- .1 Not used.

1.4 ADMINISTRATIVE

- .1 Submit to the Departmental Representative submittals listed for review. Submit with reasonable promptness (typically five working days) 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 Work affected by submittal shall not proceed 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 co-ordinated 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 is co-ordinated.
- .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 review.
- .10 Keep one reviewed copy of each submission on site.

1.5 SHOP DRAWINGS AND MIX DESIGNS

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in, Alberta, Canada.
- .3 The term "mix design" means engineered design for proportioning materials in concrete including all supporting test results, materials properties and Engineer's letter of recommendation.
- .4 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 co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

- .5 Allow 14 Calendar days for the Departmental Representative's review of each submission.
- .6 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.
- .7 Make changes in shop drawings as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of revisions other than those requested.
- .8 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.
- .9 Submissions shall 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 shop drawing submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .10 After the Departmental Representative's review, distribute copies.
- .11 Submit an electronic copy of the shop drawings and/or mix design for each requirement requested in the Specification Sections and as requested by the Departmental Representative.

- .12 Submit electronic copies of product data sheets or brochures for requirements requested in Specification Sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of the product.
- .13 Submit electronic copies of test reports for requirements requested in Specification Sections and as requested by the Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that 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 6 months of date of contract award for project, if not separately identified in the project specifications.
- .14 Submit electronic copies of certificates for requirements requested in Specification Sections and as requested by the 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 project contract complete with project name.
- .15 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.
- .16 Submit electronic copies of Manufacturer's Field Reports for requirements requested in Specification Sections and as requested by the Departmental Representative.
- .17 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 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 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 Work may proceed.
- .21 The review of shop drawings and mix designs by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that the Departmental Representative approves detail design inherent in documents, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions or of responsibility for meeting all requirements of construction and Contract Documents.
 - .2 Without restricting generality of the foregoing, Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertain solely to fabrication processes or to techniques of construction and installation, for field testing to confirm installed products meet the specifications and for co-ordination of Work of all sub-trades.

1.6 REQUIRED CONTRACTOR SUBMITTALS

.1 General

- .1 This Clause identifies the plans, programs, and documentation required prior to mobilization on site and during the construction phase.

.2 Pre-Mobilization Submittals

- .1 Submit the following plans and programs to the Departmental Representative for review a minimum of fifteen (15) days prior to mobilization to the project site. The Contractor shall not begin any site Work until the Departmental Representative has authorized acceptance of the submittals in writing. The Contractor shall not construe the Departmental Representative's authorization of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Authorization of the programs shall not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal or Provincial regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor shall remain solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.
 - .1 Project Schedule, detailing the schedule of the workdays and manpower required to complete each phase of the project (e.g., mobilization, construction sequencing, removal of deteriorated material, reconstruction of joints and demobilization).
 - .2 Contractor Chain of Command, listing key Contractor personnel, including names and positions, addresses, telephone, cellular telephone and/or pager numbers. The list shall include the names and telephone/cellular telephone/pager numbers for contact persons who are available on a 24-hour basis in the event of emergencies.
 - .3 Work Plan, describing the Contractor's intended methods of construction including but not limited to the environmental mitigation strategies and projected number of personnel on site.
 - .4 Quality Control Plan in accordance with Section 01 45 00 – Quality Control.
 - .5 Environmental Protection Plans (EPP) and Environmental Construction Operations Plans (ECO Plans) which shall meet the requirements of Section 01 35 43 - Environmental Procedures.
 - .6 Contractor shall develop an "Emergency Procedures Protocol" in consultation with Parks Canada. Parks Canada will supply the Contractor with a template with contact names and numbers to be used for this purpose.
 - .7 Health And Safety Plan - The Contractor shall have a Certificate of Recognition (COR) or Registered Safety Plan (RSP) including a site specific Health and Safety Plan acceptable to the Departmental Representative. The Contractor shall implement and maintain the Health and Safety Plan during the Work.
 - .8 Health and Safety Plan must include:
 - .1 Contractor's safety policy.
 - .2 Identification of applicable compliance obligations.

- .3 Definition of responsibilities for project safety/organization chart for project.
 - .4 Site specific hazard assessment.
 - .5 General safety rules for project.
 - .6 Job specific safe work procedures.
 - .7 Inspection policy and procedures.
 - .8 Incident reporting and investigation policy and procedures.
 - .9 Occupational Health and Safety meetings.
 - .10 Occupational Health and Safety communications and record keeping procedures.
 - .11 Results of safety and health risk or hazard analysis for site tasks and operation.
- .9 Submit copies of Material Safety Data Sheets (MSDS).
 - .10 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.
 - .11 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
- .2 The Contractor shall not begin any site Work until the Departmental Representative has authorized acceptance of the submittals in writing.
- .3 Construction Phase Submittals
 - .1 Weekly Progress Reports that outline the Work completed to date as well as the anticipated Work to be performed for the following week on a day-by-day basis.
 - .2 Quality Control Inspection Reports - The Contractor shall maintain daily inspection reports that itemize the results of all Quality Control inspections conducted by the Contractor. The reports shall be made available for review by the Departmental Representative upon request. A summary of all Quality Control inspections conducted to date shall be submitted by the Contractor with each payment request.
 - .3 Shop Drawings – The Contractor shall submit all shop drawings required to fabricate and conduct the work a minimum 30 days prior to fabrication.
 - .4 Progress Photographs:
 - .1 Formats:
 - .1 Prints 200 x 300 mm, colour, and glossy, complete with binding edge or in three hole plastic sleeves.
 - .2 Electronic: .jpg files, minimum five mega pixels.
 - .2 Submission requirements: three sets of prints and one set of electronic files.
 - .3 Identification: typewritten name and number of project, description of photograph, jpg file name, and date of exposure on 25 x 50 mm white patch in upper right hand corner.
 - .4 Viewpoints: 4 viewpoints determined by the Departmental Representative.

- .5 Submission Frequency: prior to commencement of work and weekly thereafter with progress statement, or as directed by the Departmental Representative.
- .6 Submit four copies of CD with all electronic pictures as part of closeout package.
- .6 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to the Departmental Representative and authority having jurisdiction weekly.
- .7 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .8 Submit copies of incident and accident reports.
- .4 Project Completion Submittals
 - .1 Record Drawings -The Contractor shall submit copies of all Contractor's Drawings revised as necessary to record all as-built changes to the Work and the Contractor shall submit a set of Contract Drawings clearly marked to record as-built changes to the Work.
 - .2 Quality Control/Quality Assurance Records – The Contractor shall submit a bound and itemized set of project quality control and quality assurance records.

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

SECTION 01 35 29.06 HEALTH AND SAFETY REQUIREMENTS

Part 1 General

1.1 SECTION INCLUDES

- .1 Health and safety considerations required to ensure that PCA shows due diligence towards health and safety on construction sites.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures

1.3 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 Act, R.S.A..

1.4 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 site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operations found in work plan.
- .3 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to the Departmental Representative and the authority having jurisdiction weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS Material Safety Data Sheets (MSDS) to the Departmental Representative, in accordance with Section 02 81 01 - Hazardous Materials.
- .7 The Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 14 days after receipt of plan. Revise plan as appropriate and resubmit plan to the Departmental Representative within 7 days after receipt of comments from the Departmental Representative.
- .8 The Departmental Representative's review of 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.

1.5 FILING OF NOTICE

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

1.6 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.7 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- .2 Conduct weekly safety meetings at the beginning of each week to discuss the scheduled work for that week and the associated safety hazards.

1.8 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on 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 re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to 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.

1.10 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORSEEN HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province. Advise the Departmental Representative immediately verbally and in writing.

1.12 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

- .1 Have minimum 2 years site-related working experience specific to activities associated with bridge construction.
- .2 Have working knowledge of occupational safety and health regulations.
- .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .5 Be on site during execution of Work and report directly to and be under direction of the site supervisor.

1.13 POSTING OF DOCUMENTS

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

1.14 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by 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.

1.15 BLASTING

- .1 Blasting or other use of explosives is not permitted.

1.16 POWDER ACTUATED DEVICES

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

1.17 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

- .1 Not used.

Part 3 Execution

- .1 Not used.

END OF SECTION

SECTION 01 35 33 BRIDGE REPLACEMENT SPECIAL PROCEDURES

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 14 00 - Work Restrictions
- .2 Section 01 29 00 - Payment Procedures
- .3 Section 01 35 43 - Environmental Procedures.
- .4 Section 03 10 00 - Concrete Forming and Accessories.
- .5 Section 03 20 00 - Concrete Reinforcing.
- .6 Section 03 30 00 - Cast-In-Place Concrete.
- .7 Section 05 12 33 - Steelwork.

1.2 WORK INCLUDED

- .1 **Truss Installation:** Installation of new pre-fabricated aluminum truss bridges including helicopter transportation, placement and final fit-out for use.
- .2 The aluminum trusses shall be fabricated in accordance with drawings 101 and 102 and specifications included therein.

Part 2 Products

- .1 Bearing Pads shall be:
 - .1 Goodco Z-Tech e-series plain elastomeric bearings with durometer value of 50;
or
 - .2 An approved equivalent acceptable to the Departmental Representative.
- .2 Rubber Mats for wearing surface shall be:
 - .1 Eco-flex industrial floor matting 25.4mm thickness; or
 - .2 An approved equivalent acceptable to the Departmental Representative.

Part 3 Execution

3.1 TRUSS INSTALLATION

- .1 Contractor to undertake and submit the following prior to installation of the trusses:
 - .1 Complete survey of anchor bolt locations, compare with post-fabricated measurements of trusses and confirm variances are within accepted tolerance.
 - .2 Provide written confirmation by fabricator of total mass of each truss
 - .3 Prepare a lifting and lowering plan for the truss for approval by the Departmental Representative in accordance with rigging requirements as specified on the drawings. This should include:

- .1 The methodology for guiding the truss into the correct position
 - .2 The proposed method for release of the truss once placed in the correct position;
 - .3 Emergency release methods
 - .4 Site lifting location and proposed helicopter route
- .2 Following placement, Nylock nuts to be installed and hand tightened to finger-tight only.
 - .3 Following placement, gap between trusses at Pier to be measured and recorded along with ambient temperature.
 - .4 Rubber matting to be installed as described on the drawings and as directed by the Departmental Representative. Mats may be field cut if required using a method recommended by the manufacturer.

END OF SECTION

SECTION 01 35 43 ENVIRONMENTAL PROCEDURES

Part 1 General

1.1 RELATED SECTIONS

- .1 All Specifications.

1.2 MEASUREMENT PROCEDURES

- .1 The cost to the Contractor to meet the environmental and aesthetic protection requirements described below shall be considered incidental to the Work and no additional payment will be made.

1.3 GENERAL

- .1 All Contractor operations shall be performed in such a manner that no detritus from his operations shall enter any river, waterway, ditch, or wetland within Banff National Park.
- .2 If, in the opinion of the Departmental Representative or Parks Canada, full containment of Contractor's detritus is not being achieved, operations may be ordered halted until the situation is rectified.
 - .1 The Contractor shall refer to the Basic Impact Analysis prepared for the Work which is provided as a reference document.

1.4 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 sub-Contractors 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, PCA Environmental Officer.

1.5 CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)

- .1 Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA) 2003 and subsequent amendments.
- .2 The Contractor is required to prepare an Environmental Protection Plan (EPP), which will include the topics in the following sub sections.
- .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 reasonably 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.

1.6 RELICS AND ANTIQUITIES

- .1 Give immediate notice to Parks Canada if evidence of archaeological finds are 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 the 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.

1.7 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. The Banff Warden Services 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.

1.8 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, sewer or drainage systems.
- .3 Control dispersal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .4 The Contractor's EPP will detail how the dewatering will be undertaken, with special attention to the environmental sensitivity of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond reclamation.

1.9 FIRE PREVENTION AND CONTROL

- .1 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 fire fighting 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 wildfire events during the "environmental briefing".
- .2 Machinery and equipment shall be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.

- .3 Care shall be taken while smoking on the construction site to ensure that accidental ignition of any flammable material is prevented. Fires or burning of waste materials are not permitted.
- .4 The Contractor shall maintain an awareness of the fire danger rating (Index) in the work area by contacting the Banff Fire Duty Officer. Fire prevention care is to be commensurate with the fire Index.
- .5 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.
- .6 Deliberately lighting of fires or burning of waste materials is strictly not permitted.

1.10 SITE ACCESS AND PARKING

- .1 A plan detailing access to the construction site shall be prepared by the Contractor and included in the EPP. This includes access and facilities at trail head and within the work limits, including day-to-day entry/egress and plans for delivery and approach for large dimension materials will be anticipated and described. Any proposed use of a helicopter shall be detailed. The access plan shall describe worker transportation to and from the construction site, and parking of workers' private vehicles. Specific details of any vehicles to transport workers to site or site equipment to be used on the trails to be provided.
- .2 Restrict vehicle movements to work limits.
- .3 Do not park vehicles in areas beyond work limits, unless specifically authorized by the ESO and the Departmental Representative.
- .4 A construction office is anticipated for the bridge contract. The construction office may be located at a trail head, actual location subject to the approval of the Departmental Representative and ESO. It is anticipated the construction office may comprise the Contractor's main office, a materials testing trailer and ESO trailer and toilets.
- .5 As an alternative to the above mentioned locations, a Contractor's office and work headquarters may be established at another location at the discretion of Parks Canada. The Contractor shall prepare a plan regarding structures, equipment, waste materials management, water, power and sewage services, materials lay-down area, fuel storage, operations, etc. required at this location. The plan will be subject to review and approval by the Departmental Representative. This site may be shared with other Contractors.
- .6 A workers' accommodation camp will not be permitted.

1.11 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.
 - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.12 CONTRACTOR'S OPERATIONS

- .1 Confine all operations to the work limits as staked or designated by the Departmental Representative. No activities of any kind may be carried out beyond those work limits without the written permission of the Departmental Representative.
- .2 Do not store or stockpile construction materials in the trees bordering or being preserved on site. Do not unreasonably encumber the site with products.
- .3 Provide sufficient sanitary facilities and maintain in a clean condition.
- .4 Conduct operations at all times in such a manner as to preserve the natural features and vegetation in the area. Cut and fill slopes shall be blended with adjoining topography. Material from fill slopes shall not be permitted to slough or roll into surrounding tree cover or to bury any plant material designated to be retained.
- .5 When in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the staked or designated work area, the Contractor shall be responsible, at his expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Parks Canada.
- .6 Failure to comply with or observe environmental protection requirements as identified in these specifications may result in work being suspended pending rectification of the problems and operators of equipment being charged under the National Park Act.

1.13 WORK AROUND AND OVER WATER

- .1 The construction project is such that some work will need to take place inside the wetted perimeter of river. With the exception of demolition of the old north abutment, which is in-stream, current water levels are expected not to significantly increase prior to the spring melt in early 2014, such that proposed work can be completed in "the dry" and dewatering of the river is not anticipated. The Contractor is to describe measures in the EPP, to be employed to ensure fugitive materials, and especially deleterious substances do not enter the rivers or any other waterway – e.g. material produced by placement of concrete and concrete curing. Refer to section 01 11 00 Summary of Work for specific directions with respect to demolition of existing abutments.
- .2 Sediment control measures shall be to the satisfaction of the ESO.
- .3 Fuel management requirements are explained in the Equipment Fuelling, and Spill Containment sub section.
- .4 Do not operate construction equipment in waterways.

1.14 POLLUTION CONTROL

- .1 Maintain all temporary erosion and pollution control features for this project.
- .2 Control emissions from equipment and plant to local authorities emission requirements.
- .3 Prevent blasting and other extraneous materials from contaminating air beyond application area by providing suitable, temporary enclosures or mats to the satisfaction of the Departmental Representative and the ESO.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads and on-site work.

1.15 START-UP AND ENVIRONMENTAL BRIEFING

- .1 All staff employed at the construction site shall attend a briefing regarding their individual and collective responsibilities lasting approximately 1 hour, to ensure avoidable adverse environmental impact does not arise from their activities and personal choices. Employees must attend this briefing before beginning their work at the site. Each employee, having received the environmental briefing, will be issued a certification sticker to be displayed on their helmet. Employees of other service and materials providers who attend at the site – e.g. concrete truck operators, crane operators, and truck drivers must be apprised of their duty not to cause adverse environmental impact.
- .2 Parks Canada will have an ESO attending the site to monitor the construction activity for conformance with the EPP. The ESO or alternate designated Parks Canada staff member will present the "environmental briefing". The ESO's main duties are to monitor the progress of the construction on an on-going basis to ensure compliance with environmental protection measures, and to provide guidance through the Departmental Representative, in the event of unanticipated environmental problems. Although the ESO has authority to enforce National Parks Act violations, direction to the Contractor will be the duty of the Departmental Representative.

1.16 HAZARDOUS PRODUCTS AND MATERIALS

- .1 A list of products and materials to be used or brought to the construction site that are considered or defined as hazardous to the environment shall be presented in the EPP. Such products include, but are not limited to, grout, concrete finishing agents, , paint, , etc. A plan detailing the containment and storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the application of these products shall be presented in the EPP. Hazardous products shall be stored no closer than 100 m from any waterway.

1.17 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. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment.

1.18 EQUIPMENT FUELLING AND MAINTENANCE

- .1 Equipment used on the project shall be fuelled with E10 gasoline and low sulphur diesel fuels.
- .2 A fuel delivery, storage and distribution plan shall be submitted. Topics to be addressed in the EPP will include, but not necessarily be limited to:

- .1 Diesel and gasoline supply vehicles, including bulk tankers shall be parked more than 100 meters 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.

1.19 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's hierarchy, with Reduction as first 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 Parks.
 - .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 waste food stuffs are 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 arrangement 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.

1.20 VEGETATION REMOVAL AND PROTECTION OF THE WORK LIMITS

- .1 The EPP shall detail how the work limits will be marked and what procedures will be employed to ensure trespass outside these limits does not occur. No vegetation or tree removal is required for this contract. Any vegetation wilfully or negligently removed shall be replaced in size and kind two fold.

1.21 SENSITIVE AND NO-GO ZONES

- .1 The ESO may identify sensitive areas and no-go zones in proximity to the work site. Even though these areas may lie outside the construction limit they must not be intruded into by personnel. The Contractor shall describe measures to be employed to achieve that goal.

Part 2 Products

- .1 Not Used.

Part 3 Execution

3.1 CONCRETE MANAGEMENT

- .1 Wet and uncured concrete 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 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.

3.2 STORAGE AND CONTAINMENT OF EXCAVATED MATERIAL

- .1 The EPP shall detail the plan for both temporary storage and permanent disposal of surplus excavated material.

3.3 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES

- .1 Removal and storage of snow shall be described, and a plan approved by the ESO and the Departmental Representative.
- .2 Develop a response plan for, and be suitably equipped for, fires on and immediately adjacent to the work area.

END OF SECTION

SECTION 01 45 00 QUALITY MANAGEMENT

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 MEASUREMENT PROCEDURES

This Work shall be incidental to contract and will not be measured for payment.

1.3 DEFINITIONS

- .1 Quality Control (QC): The process of checking specific product or services to determine if they comply with relevant quality standards and identify ways to eliminate causes of unsatisfactory product or service performed.
- .2 Quality Assurance (QA): The process of ensuring that the Contractor's Quality Management Plan (QMP) (QC, non-conformances, etc.) is being followed. The results of the QA are provided as feedback to both the Contractor and the Departmental Representative. Where required, the Contractor shall implement changes to the project based on the feedback received from the QA process.

1.4 QUALITY MANAGEMENT PROGRAM

- .1 The Contractor shall prepare a Quality Management Program. The purpose of the program shall be to ensure the performance of the Work in accordance with Contract requirements.
- .2 The Quality Management Program shall be described in a Quality Management Plan. The Contractor shall submit the Quality Management Plan to the Departmental Representative for acceptance in accordance with Section 01 33 00 - Submittal Procedures. The Plan shall develop a logical system for tracking and documenting the Quality Control of the Work as well as the Contractor's internal Quality Assurance procedures to verify the compliance of the Quality Control process. A systematic format and a set of procedures patterned on a recognized Quality Control Standard will be acceptable, subject to review by the Departmental Representative.
- .3 The Quality Management Plan shall at a minimum include the following information:
 - .1 Distribution list, providing a list of names to whom the Manual shall be distributed;
 - .2 Title page, identifying the Contract, Contractor and copy number;
 - .3 Revision page, identifying the revision number and date of the Manual;
 - .4 Table of contents;
 - .5 Revision control, tabulating the revision number, date of revision, description of revisions and authorized signature;
 - .6 Details of measuring and test equipment including methods and frequency of calibration;
 - .7 Purchasing details of all materials and equipment including procurement documents and vendor's Quality Control Program standards;
 - .8 Procedures for inspection of incoming items, in-process inspection and final inspection and tagging of all supply items;

- .9 Details of special processes as identified by the Departmental Representative, including qualifications of personnel and certification;
 - .10 Procedures for shipping, packaging and storage of materials;
 - .11 Procedures for maintaining quality records and Statements of Compliance, including filing and storage of documents for a period of one year after Completion of the Works;
 - .12 Details of any non-conformance, including identification and recording of deficiencies, tagging procedures for "HOLD" or "REJECT" items, and final disposition of non-conformance forms by the Quality Control Manager;
 - .13 Inspection and test checklists, including tabulated checklists describing all manufacturing and delivery activities such as Inspection or Test, frequency of tests, description of tests, acceptance criteria of tests, such as verification, witnessing or holding tests and sign-off by the Quality Control Manager and the Quality Assurance Manager, if the Quality Assurance Manager witnesses the tests;
 - .14 Forms used to ensure the application of the inspection and test checklist requirements. These forms shall be identified in the checklists and describe all testing requirements for Specification compliance; and
 - .15 Details of the Quality Assurance Program including the Contractor's procedures to verify the compliance to the Quality Control process of on-site work and off-site work by fabricators.
- .4 The Contractor shall appoint qualified and experienced Quality Control and Quality Assurance Personnel, who are dedicated to quality matters and who will report regularly to the Quality Control Manager and Quality Assurance Manager as well as Contractor's management at a level which shall ensure that Quality Control and Quality Assurance requirements are not to be subordinated to manufacturing, construction or delivery. The Quality Control and Quality Assurance Personnel shall be empowered by the Contractor to resolve quality matters. Personnel involved in Quality Assurance shall be independent of the Quality Control Process.
- .5 The Quality Management Plan shall include samples of all forms to be filled in by the Quality Control and Assurance Personnel. All forms shall be signed by the Quality Control Manager and Quality Assurance Manager and submitted promptly to the Departmental Representative.
- .6 An independent check of all Work shall be performed by the Contractor. The Contractor shall appoint Quality Control Inspectors to ensure compliance of products and workmanship with Contract requirements. Quality Assurance Inspectors, will periodically (shall be a minimum of 10% of the Quality Control checks) perform a second independent check to assess if the Quality Control process is being followed. The same personnel may not be used to perform a given task and to check the quality and accuracy of the task.
- At completion of the Work a bound and itemized copy of all Quality Control and Quality Assurance documents and reports shall be prepared by the Contractor's Quality Control Manager and Quality Assurance Manager and submitted to the Departmental Representative.

1.5 TESTING

- .1 Testing required to provide Quality Control and Quality Assurance to assure that the Work strictly complies with the Contract requirements shall include, but not be limited to:

- .1 Testing of all structural concrete, reinforcing steel, granular material, asphalt, miscellaneous structural elements and metals, utilities installed, and all source acceptance testing;
 - .2 Coating test patches including over-wintering;
 - .3 All testing specified in the Contract Documents; and
 - .4 Any other testing required as a condition for deviation from the specified Contract procedures.
- .2 The quality control testing proposed and testing frequency shall at a minimum, achieve the requirements of the following:
- .1 The more stringent of the testing requirements in the 2010 Alberta Transportation Standard Specifications for Highway Construction Manual and subsequent updates or Alberta Transportation - Standard Specification for Bridge Construction 2013. Should one of these specifications be silent on a particular testing frequency the testing frequency shall be as defined in the BC MoT Standard Specifications (Highway Construction and or Bridge Construction, latest edition).
 - .2 Wherever these standard specifications refer to standards (e.g., CSA, ASTM, and others) the minimum testing frequencies in these standards shall be utilized.
 - .3 The Contractor and its independent Quality Assurance testing agency that will carry out the testing must satisfy themselves that the test frequencies being completed are sufficient to ensure the quality requirements of the QMP.
- .3 The Contractor shall be fully responsible and bear all costs for all quality control testing and shall conduct such testing in the following manner:
- .1 Provide testing facilities and personnel for the tests and inform the Departmental Representative in advance to enable the Departmental Representative to witness the tests if it so desired;
 - .2 Notify the Departmental Representative when sampling will be conducted;
 - .3 Within one Day after completion of testing, submit test results to the Departmental Representative; and
 - .4 Identify test reports with the name and address of the organization performing all tests, and the date of the tests.
- .4 Approval of tested samples will be for characteristics or use named in such approval and shall not change or modify any Contract requirements.
- .5 Testing agencies, their inspectors, and their representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the Contract Documents, nor to approve or accept any part of the Work.
- .6 Quality Assurance testing will be undertaken by the Contractor through an independent CSA certified testing firm. The independent testing firm will complete random sampling, inspection, and testing for the purposes of determining the compliance with specifications and other contract documents. The frequency, location of the inspections, sampling, and tests shall be a minimum of 10% of the Quality Control testing frequency.
- .7 The Contractor shall be responsible for third party testing of materials incorporated into the works.

- .8 The Departmental Representative may perform quality audits as desired. Such audits will not relax the responsibility of the contractor to perform work in accordance with Specifications. To facilitate this work the contractor shall:
 - .1 Notify appropriate agency and Departmental Representative in advance of work which the Departmental Representative may want to test.
 - .2 Submit samples and/or materials required for testing, as specifically requested in the Specifications or as requested by the Departmental Representative. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the work.
 - .3 Provide labour and facilities to obtain and handle samples and materials on site.

1.6 INSPECTION

- .1 Allow 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 requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections, or approvals before such is made; Contractor shall uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative may order any 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, the Contractor shall correct such Work and pay costs of examination and correction.

1.7 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies may be engaged by the Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .3 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. The Contractor shall correct the defect and irregularities as advised by the Departmental Representative at no cost to the Departmental Representative.

1.8 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.

1.9 REJECTED WORK

- .1 Any instances of unacceptable work discovered by either the Quality Control or Quality Assurance personnel will require the preparation of a non-conformance report (NCR).
- .2 If instances of unacceptable work are discovered by the Departmental Representative, the Departmental Representative may issue a non-conformance report (NCR).

- .3 The Contractor shall expediently correct any non-conformances, whether the result of poor workmanship, use of defective products or damage; and whether incorporated in the Work or not, the Contractor shall replace or re-execute in accordance with the Contract Documents.
- .4 Payment for the work itself may be withheld until the NCR issue has been resolved to the satisfaction of the Departmental Representative.
- .5 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the Departmental Representative may deduct from Total Bid Amount the difference in value between Work performed and that called for by the Contract Documents, amount of which shall be determined by the Departmental Representative.

1.10 REPORTS

- .1 Submit one (1) electronic copy of all inspection and test reports to Departmental Representative in accordance with Section 01 33 00 Submittals Procedures.
- .2 Submit to the Departmental Representative one paper copy and one electronic copy of all Non-Conformance Reports.

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

SECTION 01 77 00 CLOSEOUT PROCEDURES

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 78 00 - Closeout Submittals

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
- .2 Contractor's Inspection:
 - .1 Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .2 Notify the Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .3 Request the Departmental Representative's inspection.
- .3 Departmental Representative's Inspection:
 - .1 The Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies.
 - .2 Contractor to correct Work as directed.
- .4 Completion Tasks: Submit written certificate that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies have been completed.
 - .3 Work: complete and ready for final inspection.
- .5 Final Inspection:
 - .1 When completion tasks noted above have been completed, request final inspection of Work by the Departmental Representative and Contractor. If Work is deemed incomplete by the Departmental Representative, complete outstanding items and request re-inspection.

1.3 FINAL CLEANING

- .1 A final cleaning of the site shall be undertaken by the contractor at project completion:
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
 - .2 All disturbed areas shall be returned to their original condition.

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

SECTION 01 78 00 CLOSEOUT SUBMITTALS

Part 1 General

1.1 SECTION INCLUDES

- .1 As-built drawings.
- .2 Warranties and bonds.

1.2 RELATED SECTIONS

- .1 Section 01 77 00 - Closeout Procedures

1.3 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for the 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.
 - .1 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 Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by the Departmental Representative.

1.4 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual.
- .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .2 Field changes of dimension and detail.

- .3 Changes made by change orders.
- .4 Details not shown on original Contract Drawings.
- .5 References to related shop drawings and modifications.
- .4 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .5 Other Documents: maintain manufacturer's certifications, inspection certifications, and field test records required by individual specifications sections.
- .6 Provide digital photos, if requested, for site records.

1.5 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Warranty management plan to include required actions and documents to assure that the Departmental Representative receives warranties to which it is entitled.
- .3 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .4 Submit, warranty information made available during construction phase, to the Departmental Representative for approval prior to each monthly pay estimate.
- .5 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .6 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .7 Respond in timely manner to oral or written notification of required construction warranty repair work.

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

SECTION 03 10 00 CONCRETE FORMING AND ACCESSORIES

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 29 00 - Payment Procedures.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 43 - Environmental Procedures.
- .4 Section 01 35 33 - Bridge Replacement Special Procedures.
- .5 Section 03 20 00 - Concrete Reinforcing
- .6 Section 03 30 00 - Cast-in-Place Concrete.

1.2 PRICE AND PAYMENT PROCEDURES

- .1 The measurement and payment procedure for this Section shall meet the requirements in Section 01 29 00 - Payment Procedures.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-O86S1, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
 - .3 CSA O121, Douglas Fir Plywood.
 - .4 CSA S269.1, Falsework for Construction Purposes.
 - .5 CAN/CSA-S269.3, Concrete Formwork, National Standard of Canada.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework.
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Alberta, Canada.
- .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 and CAN/CSA-S269.3 for formwork drawings.
- .4 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.
- .5 Indicate sequence of erection and removal of formwork/falsework.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Place materials defined as hazardous or toxic in designated containers.

- .2 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low volatile organic compounds (VOC's).
- .3 Dispose concrete waste in accordance with Section 01 35 43 - Environmental Procedures and as approved by the Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 Forms for unexposed surfaces are at the discretion of the Contractor subject to approval of the Departmental Representative.
- .2 Formwork shall have sufficient supports, strong-backs and/or walers to ensure straightness of the form.
- .3 Metal bolts or anchorages within the forms shall be so constructed as to permit their removal to a depth of at least 20 mm from the concrete surface.
- .4 Break-back type form ties shall have all spacing washers removed and the tie shall be broken back a distance of at least 20 mm from the concrete surface.
- .5 All fittings for metal ties shall be of such design that, upon their removal, the cavities which are left will be of the smallest possible size. Torch cutting of steel hangers and ties will not be permitted. Formwork hangers for exterior surfaces of decks and curbs shall be an acceptable break-back type with surface cone, or removable threaded type.
- .6 Cavities shall be filled with cement mortar and the surface left sound, smooth, even and uniform in colour.
- .7 Form release agent shall be non-toxic, biodegradable, and low VOC.
- .8 Falsework materials shall conform 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 Obtain the Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .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 minimum.

- .8 Use 20 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise on the drawings.
- .9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .10 Build in anchors, sleeves, and other inserts required to accommodate Work as shown on the drawings and specified in other sections. Ensure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .11 Pier foundation formwork shall be watertight to prevent river contamination.
- .12 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 2 days for cast-in-place concrete barriers, deck cantilevers and other structural members if the temperature is maintained at a minimum of 15°C .
- .2 Remove formwork when concrete has reached 75 % of its design strength or minimum period noted above, whichever comes later, or replace immediately with adequate reshoring.
- .3 Reuse formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

SECTION 03 20 00 CONCRETE REINFORCING

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 29 00 – Payment Procedures
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 33 - Bridge Replacement Special Procedures.
- .4 Section 01 35 43 - Environmental Procedures.
- .5 Section 03 10 00 - Concrete Forming and Accessories
- .6 Section 03 30 00 - Cast-in-Place Concrete.

1.2 PRICE AND PAYMENT PROCEDURES

- .1 The measurement and payment procedure for this Section shall meet the requirements in Section 01 29 00 - Payment Procedures.

1.3 REFERENCES

- .1 ASTM International
 - .1 ASTM A82/A82M, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- .2 CSA International
 - .1 CSA-A23.1-09/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3, Design of Concrete Structures.
 - .3 CSA-G30.18, Carbon Steel Bars for Concrete Reinforcement.
 - .4 CSA- G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .5 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.
- .4 Concrete Reinforcement Work shall be in accordance with British Columbia Standard Specifications for Highway Construction, Section 412, "Concrete Reinforcement."

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Alberta, Canada.
 - .1 Indicate placing of reinforcement and:
 - .1 Bar bending details.

- .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by the Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.
- .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.

1.5 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 - Quality Management and as described in PART 2 - SOURCE QUALITY CONTROL.
- .1 Mill Test Report: upon request, provide the Departmental Representative with certified copy of mill test report of reinforcing steel.
 - .2 Upon request submit in writing to the Departmental Representative proposed source of reinforcement material to be supplied.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
- .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by the Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400W, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel:
- .1 weldable low alloy steel deformed bars to CSA-G30.18.
 - .2 welded deformed wire reinforcement to CSA-G30.15
- .4 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .5 Chairs, bolsters, bar supports, spacers: to CSA-A23.1.
- .6 Mechanical splices: subject to approval of the Departmental Representative.
- .7 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada, unless indicated otherwise.
- .2 All hooks and bends shall be bent using the pin diameters and dimensions as recommended in the Reinforcing Steel Institute of Canada (RSIC), Manual of Standard Practice.
- .3 Obtain the Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.
- .4 Upon approval of the Departmental Representative, weld reinforcement in accordance with CSA W186.
- .5 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Provide the Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.
- .2 Inform the Departmental Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by the Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars that develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on drawings and in accordance with CSA-A23.3.
- .2 Prior to placing concrete, obtain the Departmental Representative's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete pour.
- .4 Welding of reinforcement is not permitted.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

SECTION 03 30 00 CAST-IN-PLACE CONCRETE

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 29 00 – Payment Procedures
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 33 - Bridge Rehabilitation Special Procedures.
- .4 Section 01 35 43 - Environmental Procedures.
- .5 Section 01 45 00 - Quality Management.
- .6 Section 01 74 11 - Cleaning.
- .7 Section 03 10 00 - Concrete Forming and Accessories.
- .8 Section 03 20 00 - Concrete Reinforcing.

1.2 PRICE AND PAYMENT PROCEDURES

- .1 The measurement and payment procedure for this Section shall meet the requirements in Section 01 29 00 - Payment Procedures.

1.3 REFERENCES

- .1 All cast-in-place concrete work shall be in accordance with Alberta Transportation Specifications for Bridge Construction, Section 4 “Cast-in-Place Concrete”
- .2 Alberta Bridge Structures Design Criteria 2012, Section 5 "Materials".
- .3 CSA International
 - .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A283-06, Qualification Code for Concrete Testing Laboratories.
 - .3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide testing results and reports for review by the Departmental Representative and do not proceed without approval when deviations from mix design or parameters are found.
- .3 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.
- .4 Concrete hauling time: provide for review by the Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.5 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Management.

- .2 Provide the Departmental Representative, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete. Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.
- .3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by the Departmental Representative on following items:
 - .1 Falsework erection.
 - .2 Hot weather concrete.
 - .3 Cold weather concrete.
 - .4 Curing.
 - .5 Finishes.
 - .6 Formwork removal.
 - .7 Joints.
- .4 Quality Control Plan: provide written report to the Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Concrete hauling time: deliver to site of Work and discharged within 90 minutes maximum after batching.
 - .1 Deviations to be submitted for review by the Departmental Representative.

Part 2 Products

2.1 CONCRETE MIX

Alberta Transportation Specifications for Bridge Construction, Section 5.5, Class “C” ad summarised in the following table:

Minimum Compressive Strength @ 28 Days MPa	Size of Course Aggregate mm	Range of Slump mm	Entrained Air Content. %	Max. Water Cement Ratio
30	20 to 5	60 to 80	5 - 8	0.42

- .1 Ready-mix or pre-bagged mix conforming to the above will be acceptable.

Part 3 Execution

3.1 PREPARATION

- .1 Obtain the Departmental Representative's approval before placing concrete. Provide 24 hours minimum notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
 - .1 Development of cold joints not allowed except where indicated on the drawings.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Prior to placing of concrete obtain the Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .6 Protect previous Work from staining.
- .7 Clean and remove stains prior to application for concrete finishes.
- .8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

3.2 INSTALLATION/APPLICATION

- .1 Cast-in-place concrete work in accordance with Alberta Transportation specifications and CSA A23.1/A23.2
- .2 Special attention shall be made to the requirements concreting in cold weather required by the Alberta Transportation Specifications for Bridge Construction
- .3 Bearing Seats shall have a trowelled finish to CSA A23.1.

3.3 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit results.
 - .1 Concrete pours.
 - .2 Slump.
 - .3 Air content.
 - .4 Compressive strength at 7 and 28 days.
 - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1. Ensure testing laboratory is certified to CSA A283.
- .3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Departmental Representative.
- .4 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

3.4 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Divert unused admixtures and additive materials from landfill to official hazardous material collections site as approved by the Departmental Representative.
- .3 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental damage.
- .4 Prevent admixtures and additive materials from entering drinking water supplies or streams.
- .5 Using appropriate safety precautions collect liquid or solidify liquid with inert, noncombustible material and remove for disposal. Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION

SECTION 05 12 33 STEELWORK

Part 1 General

1.1 STEELWORK INCLUDES

- .1 Structural steel for Pier bent
- .2 Anchors, Anchor Bolts and Spacers.
- .3 Steel plates for retaining abutment backfill
- .4 Steel plate embedded in south abutment
- .5 Bicycle Railings and Connection Brackets.
- .6 Miscellaneous Steel Components.

1.2 RELATED SECTIONS

- .1 Section 01 29 00 - Payment Procedures.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 33 - Bridge Replacement Special Procedures.
- .4 Section 01 15 43 - Environmental Procedures.

1.3 PRICE AND PAYMENT PROCEDURES

- .1 The measurement and payment procedure for this Section shall meet the requirements in Section 01 29 00 - Payment Procedures.

1.4 REFERENCES

- .1 CSA International
 - .1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA S6-06, Canadian Highway Bridge Design Code.
 - .4 CSA S16-09, Design of Steel Structures.
 - .5 CSA W59, Welded Steel Construction.
- .2 ASTM
 - .1 ASTM A-252 Standard Specification for Welded and Seamless Steel Pipe Piles

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for structural steel and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit copies of WHMIS MSDS in accordance with Section 01 35 29.06 Health and Safety Requirements and 01 35 43 - Environmental Procedures.

.3 Shop Drawings:

- .1 Submit drawings stamped and signed by professional engineer registered or licensed within the Province of Alberta, Canada.
- .2 Indicate shop and erection details including shop splices, cuts, copes, connections, holes, bearing plates, threaded fasteners, rivets and welds. Indicate welds by CSA W59, welding symbols.
- .3 Proposed welding procedures to be stamped and approved by Canadian Welding Bureau.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
 - .1 Provide protective blocking for lifting, transportation and storing.
 - .1 Exercise care during fabrication, transportation and erection of bicycle railings.
 - .2 Do not cause excessive stresses.
 - .2 Mark mass on members weighing more than 3 tonnes.
 - .3 Protect unpainted weathering steel, before erection, with waterproof covering.
 - .4 Ensure that no portion of steel comes into contact with ground.

1.7 QUALITY ASSURANCE

- .1 Preconstruction Testing:
 - .1 Provide suitable facilities and cooperate with the Departmental Representative in carrying out inspection and tests required.

Part 2 Products

2.1 STRUCTURAL STEEL FOR PIER BENT

- .1 Piles: to ASTM A-252 Grade 2
- .2 Structural Sections: to CSA G40.21, grade 350A
- .3 Structural steel plates: to CSA G40.21, grade 300A
- .4 Hot-dip galvanizing: to CSA G164, Table 1, minimum zinc coating of 600 g/m².
- .5 Field touch-up of galvanizing at field weld locations to be minimum two coats of brush applied zinc rich epoxy.
- .6 Welding: to CSA W59

2.2 ANCHOR RODS, ANCHOR BOLTS AND ROCK ANCHORS

- .1 As specified on the drawings.

2.3 STEEL PLATES TO RETAIN BACKFILL ON ABUTMENTS

- .1 Structural steel plates: to CSA G40.21, grade 350W galvanized.
- .2 Hot-dip galvanizing: to CSA G164, Table 1, minimum zinc coating of 600 g/m².

2.4 STEEL BICYCLE RAILINGS

- .1 All steel bicycle railings, shall be supplied, fabricated and installed in accordance with the design drawings.
- .2 Structural steel HSS: to be 48mm O.D. to ASTM A 53 Grade 240 MPa galvanized.
- .3 Structural steel plates: to CSA G40.21, grade 350W galvanized.
- .4 Anchor bolts: to ASTM F1554 grade 55 galvanized.
- .5 Hot-dip galvanizing: to CSA G164, Table 1, minimum zinc coating of 600 g/m².
- .6 Welding: to CSA W59

2.5 MISCELLANEOUS STEELWORK

- .1 All other miscellaneous steelwork shall be supplied, fabricated and install in accordance with applicable CSA International provisions.

2.6 SOURCE QUALITY CONTROL

- .1 Steel producer qualifications: certified in accordance with CSA G40.20/G40.21.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for structural steel installation in accordance with manufacturer's written instructions.
 - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Clean steel surfaces as directed by Departmental Representative when staining or defacing occurs.
- .2 Field welding is not be permitted.

3.3 CLEANING

- .1 Progress Cleaning: Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove foreign materials, tools and equipment.

END OF SECTION

SECTION 31 00 00 EARTHWORKS

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 29 00 - Payment Procedures.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 33 - Bridge Replacement Special Procedures.
- .4 Section 01 15 43 - Environmental Procedures.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM D698-[07e1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft²) (600kN-m/m²).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

Part 2 Products

2.1 MATERIALS

- .1 For use on approach trail reconstruction and abutment filling and backfilling, locally sourced granular material can be used as directed by the Departmental Representative.

Part 3 Execution

3.1 PREPARATION

- .1 Temporary erosion and sedimentation control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent waterway.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Protection of in-place conditions:
 - .1 Protect excavations from freezing.
 - .2 Keep excavations clean, free of standing water, and loose soil.
 - .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.

- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

3.2 EXCAVATION

- .1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Alberta regulations.
- .2 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.
 - .1 Stockpile topsoil on site for later use.
- .3 Excavate as required to carry out work.
 - .1 Do not disturb soil or rock below bearing surfaces.
 - .2 Notify Departmental Representative when excavations are complete.
 - .3 If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work.
 - .4 Excavation taken below depths shown without Departmental Representative's written authorization to be filled with concrete of same strength as for footings at Contractor's expense.

3.3 FIELD QUALITY CONTROL

- .1 Do not begin backfilling or filling operations until material has been approved for use by Departmental Representative.

3.4 BACKFILLING

- .1 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .2 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
 - .1
- .3 Placing:
 - .1 Place backfill, fill and base course material in 150 mm lifts: add water as required to achieve specified density.
- .4 Compaction: compact each layer of material to 90% of Proctor Density to ASTM D698
- .5 Against foundations: excavated material or imported material with no stones larger than 100 mm diameter within 600 mm of structures.

3.5 GRADING

- .1 Grade so that water will drain away from abutments.

3.6 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.

- .2 Dispose of cleared and grubbed material off site daily.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment

END OF SECTION