

1 GENERAL

1.01 PROFESSIONAL ENDORSEMENT

END OF SECTION

1 GENERAL

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2 PRODUCTS

2.01 NOT USED

- .1 Not Used

3 EXECUTION

3.01 NOT USED

- .1 Not Used

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies a summary of the Work scope to be completed as part of the project.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 DEFINITIONS

- .1 "Departmental Representative" Within the context of these specifications, this refers to the person exercising the roles and attributes of Canada under the contract. Parks Canada Agency will be fulfilling the role of Departmental Representative for this Contract. Parks Canada Agency reserves the right to assign an alternate representative to serve as their alternate as deemed appropriate by the Departmental Representative.
- .2 "Contractor" The contractor to undertake the site management and operation services defined, within the context of these specifications, as the Contractor.
- .3 "Growing Season" the time period referred to within this document relevant to project which includes the months of May through October (inclusive).

1.03 PROJECT LOCATION

- .1 The project location is within the Rocky Mountain House National Historic Site, near Rocky Mountain House, Alberta. See Contract Drawings for details.

1.04 PROJECT OBJECTIVE

- .1 The objective of this project and associated scope of work is to revegetate the existing rip rap along the bank of the river to: increase bank stability to protect land critical for preservation of historical artifacts; and meet regulatory requirements for fish and animal habitat provision.

1.05 PROJECT SCHEDULE AND PROGRESS UPDATES

- .1 Due to the use of live planting material, the scheduled start date for the construction phase of this project is May 13, 2019. Live plantings shall be installed by June 15, 2019.
- .2 The subsequent maintenance phase is scheduled to occur over the following three (3) growing seasons: Spring 2019 through to Fall 2021.
- .3 By responding to this tender, it is expected that the contractor has the equipment, materials and resources available to meet the project schedule requirements.
- .4 The departmental Representative will be provided a schedule and progress update:
 - .1 At least weekly throughout the duration of project construction phase.
 - .2 Monthly throughout the project maintenance phase.

1.06 WORK COVERED BY CONTRACT DOCUMENTS

- .1 As outlined within the Contract Drawings and specifications, work covered within this Contract is comprised of that associated with:
 - .1 Infill of the existing rip-rap.
 - .2 Placement of soils and erosion control materials.
 - .3 Supply and installation of vegetation.
 - .4 Site maintenance throughout the three growing season maintenance phase following completion of construction.
- .2 Preparation for, during and following construction of this project must meet the requirements outlined within the specifications, including Section 01 35 43 - Environmental Procedures, to ensure adverse effects and potential health and safety risks are mitigated.
- .3 Prior to commencement of construction, the Contractor must provide written confirmation to the Departmental Representative that he has read and understood and will comply with all mitigations outlined within the specifications

1.07 CONTRACT METHOD

- .1 Construct Work under a combined price contract.

1.08 WORK BY OTHERS

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from the Departmental Representative.

1.09 CONTRACTOR USE OF PREMISES

- .1 Unrestricted use of the designated access route and work area outlined within the Contract Drawings free of charge will be provided for the duration of the project.
- .2 Use of the public facilities and visitor centre during Work and access to any non-designated areas within the national historic site is not permitted.
- .3 Limit use of premises for Work, storage and access to allow continued public access along the gravel pathway and so as to maintain fire access and control. The national historic site will remain open and accessible to the public throughout the duration of the project.
- .4 Co-ordinate use of premises under direction of the departmental Representative.
- .5 Use of the designated access route and work area will be deemed to have ended when all work identified within the construction phase of this scope of work has been completed, all site clean-up has been completed and all deficiencies have been addressed to the satisfaction of the Departmental Representative (subject to final inspection).
- .6 Site access throughout the maintenance phase of the project shall be arranged with the Departmental Representative at least 7 days prior to the anticipated date of required access.

1.10 MAINTENANCE PERIOD

- .1 All work and materials will be warranted by the Contractor for a period of three years, with the end of the third year occurring at the end of the third growing season following construction.

1.11 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy of each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders.
 - .5 Other Modifications to Contract.
 - .6 Shop drawings as required
 - .7 Copy of Approved Work Schedule.
 - .8 Applicable regulatory approvals and/or permits.
 - .9 Health and Safety Plan, daily Toolbox Talks, and Other Safety Related Documents.
 - .10 Environmental Protection Plan
 - .11 Other documents as specified.

1.12 CONSTRUCTION SIGNAGE

- .1 Construction and warning signs must be used onsite in accordance with CAN3-Z321 and appear in both official languages.
- .2 Other signs or advertising are not permitted
- .3 All signage must be kept in good condition throughout the duration of the project, and removed from the site upon completion of the project, or if the stage of the project no longer requires their use.

2 PRODUCTS

2.01 NOT USED

- .1 Not used.

3 EXECUTION

3.01 NOT USED

- .1 Not used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the Work restrictions for the project.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with the Departmental Representative to facilitate work as stated.
- .2 Contractor is to provide an office trailer and worker facilities within the designated work area for use. Use of the National Historic Site public areas, including facilities and visitor centre, is not permitted. The location(s) of Contractor facilities shall be discussed with and approved by the Departmental Representative prior to installation.
- .3 Contractor is to keep all work activities and materials within the designated work area. Only the designated access route must be used to access the work area.
- .4 The Contractor is to keep all work areas clean and free of waste and garbage, and maintain good housekeeping onsite at all times.
- .5 Any damage caused to the site, including unauthorized disturbance of the soil surface will be promptly repaired by the Contractor at their own expense. The repair of any damage must be completed to the satisfaction of the Departmental Representative.
- .6 Work at the site may be conducted between dawn and dusk Monday through Friday. Further restriction of work hours may be applicable on Saturday and Sunday.

1.03 ACCESS AND EGRESS

- .1 Design, construct and maintain access to and egress from work areas in accordance with relevant municipal, provincial and other regulations.

1.04 ACCESS TO ADJACENT LANDS

- .1 Construction operations and fence installation shall be conducted so as to cause minimal inconvenience to the public.

1.05 USE OF PUBLIC AREAS

- .1 Use of the National Historic Site public areas, including facilities and visitor centre, is not permitted.
- .2 All areas within the National Historic Site property where equipment, vehicles or materials may be transported through must be kept clean and free of excessive mud and debris. Any debris or mud fallen from construction related equipment or vehicles in public areas must be removed by the Contractor.
- .3 When hauling soil, debris or other construction material, within the National Historical Site or on public roadway, truck box covers, or equivalent, should be used to prevent hauling materials from dislodging while in transport.
- .4 Any clean up required will be completed by the Contractor at no cost to the Departmental Representative.

1.06 WORK NEAR A WATERBODY

- .1 All work is to be conducted above the 1 in 2 year water level.
- .2 Work and equipment is not permitted to enter any waterbody or wetland.
- .3 All work must be completed on accordance with section 01 35 43 - Environmental Procedures and the Environmental Protection Plan prepared for the site.

1.07 SOIL DISTURBANCE AND ARCHEOLOGICAL FINDS

- .1 No disturbance of soil is permitted along all access areas, laydown areas and on the top of bank outside of those areas specifically identified within the drawings and specifications that allow for installation of potted materials by hand.
- .2 All access areas with equipment shall be covered by protective matting (i.e. access and/or rig matting or equivalent) as per the specifications and drawings
- .3 Any disturbance of suspected artifacts shall require the immediate stoppage of work and notification of the Departmental Representative.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the project management and coordination Work associated with the project.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 PROJECT TEAM IDENTIFICATION

- .1 Within five (5) days after award of Contract, provide the names of key project team members and shall include:
 - .1 Project Superintendent
 - .2 Safety Representative
 - .3 Team role identification:
 - .1 The Project Superintendent shall be present onsite throughout the project construction, coordinate and direct all aspects of the Contractors' responsibilities onsite include, equipment and personnel, ensure compliant implementation of onsite safety and environmental plans, ensure housekeeping and orderly maintenance of the site, direct execution of the scope of work.
 - .2 The Safety Representative shall possess safety experience in construction and similar projects and is responsible for all safety duties associated with the site, including ensuring onsite health and safety plans and requirements meet all applicable regulatory requirements. They must be available for support of onsite activities as required.
 - .3 If other personnel are named, provide their title and role in the project.

1.03 MEETINGS

- .1 Administrative
 - .1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.
 - .2 Prepare agenda for meetings.
 - .3 Provide physical space and make arrangements for meetings.
 - .4 Preside at meetings.
 - .5 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

- .6 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and affected parties not in attendance.
 - .7 Representative of Contractor, Subcontractor and suppliers attending meetings shall be qualified and authorized to act on behalf of party each represents.
- .2 Preconstruction Meeting
- .1 Within five (5) days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
 - .2 The Departmental Representative, key team members from the Contractor (including at minimum the Project Manager and Project Superintendent) shall be in attendance.
 - .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
 - .4 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work
 - .3 Schedule of submission of submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .5 Proposed changes, procedures, approvals required, mark-up percentages permitted, administrative requirements.
 - .6 Owner provided products.
 - .7 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .8 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .9 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .10 Monthly progress claims, administrative procedures, photographs.
 - .11 Appointment of inspection and testing agencies or firms.
 - .12 Insurances, transcript of policies.
- .3 Progress Meetings During Construction Phase
- .1 During course of construction Work onsite, schedule progress meetings at least weekly. The Departmental Representative reserved the right to increase the frequency of progress meetings at their discretion.
 - .2 Contractor and Departmental Representative are to be in attendance.
 - .3 Notify parties minimum two (2) days prior to meetings.
 - .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within two (2) days after meeting.

- .4 Agenda to include the following:
 - .1 Review of Work progress since previous meeting.
 - .2 Field observations, problems, conflicts.
 - .3 Problems which impede construction schedule.
 - .4 Review of off-site materials delivery schedules.
 - .5 Corrective measures and procedures to regain projected schedule.
 - .6 Revision to construction schedule.
 - .7 Progress schedule, during succeeding work period.
 - .8 Review submittal schedules: expedite as required.
 - .9 Maintenance of quality standards.
 - .10 Review proposed changes for effect on construction schedule and on completion date.
 - .11 Other business.

- .5 Progress Meetings During Maintenance Phase
 - .1 During course of maintenance Work onsite, schedule progress meetings monthly. The Departmental Representative reserves the right to increase the frequency of progress meetings at their discretion.
 - .2 Contractor and Departmental Representative are to be in attendance.
 - .3 Notify parties minimum five (5) days prior to meetings.
 - .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within two (2) days after meeting.
 - .5 Agenda to include the following:
 - .1 Review of Work progress since previous meeting.
 - .2 Field observations, problems, conflicts.
 - .3 Work required and schedule during succeeding work period.
 - .4 Review submittal schedules: expedite as required.
 - .5 Maintenance of quality standards.
 - .6 Other business.

1.04 WORK STOPPAGE

- .1 Precedence shall be given to protection of the health and safety of workers and public, and protection of the environment over schedule and cost targets.
- .2 Work stoppage may be requested at any time by the Departmental Representative, at their own discretion, if conditions dictate.

1.05 SUBMITTALS

- .1 Submittals are to be provided as per Section 01 33 00 - Submittal Procedure and Section 01 78 00 - Closeout Submittals.
- .2 Submittals, payment, change orders, and other requests are to be directed to the Departmental Representative.

1.06 PROJECT CLOSEOUT

- .1 Project closeout shall occur as per Section 01 77 00 - Closeout Procedure once all submittals have been provided and the final inspection has been completed by the Departmental Representative.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 NOT USED

- .1 Not Used.

4 MEASUREMENT AND PAYMENT

4.01 PROJECT MANAGEMENT AND COORDINATION

- .1 Project management and coordination is considered incidental to the contract and will not be measured for payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the submittal procedures for the construction phase and for the three (3) year maintenance phase of the Work.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 REFERENCE STANDARDS

- .1 Not used.

1.03 ADMINISTRATIVE

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

- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.
- .11 The Contractor shall not construe the Departmental Representative's authorization or approval of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Authorization or approval shall not relieve the Contractor from the responsibility to conduct the Work in strict accordance with applicable Federal or Provincial regulations, the project specifications, and 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, as well as the environment. The Contractor shall remain solely responsible for the adequacy and completeness of the work and work practices, and adherence to them.

1.04 DRAWINGS AND PRODUCT DATA

- .1 The term "drawings" means drawings, diagrams, illustrations, schedules, performance charts, 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 the registered professional authorized to work within Alberta, Canada.
- .3 Indicate materials, methods of construction, erection diagrams, explanatory notes and other information necessary for completion of Work. Indicate cross references to design drawings and specifications.
- .4 Allow five (5) business days for Departmental Representative's review of each submission.
- .5 Adjustments made on drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.

- .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .9 After Departmental Representative's review, distribute copies as required.
- .10 Submit electronic copy of drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit electronic copies of product data requested in specification Sections and as requested by Departmental Representative.
- .12 Submit electronic copies of laboratory 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 six (6) months of date of contract award for project.

1.05 SAMPLES

- .1 Submit for review laboratory sample data as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Submit signed, authorized laboratory sample data results as both pdf and tabular data (excel).
- .3 Adjustments made on sample requirements by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

1.06 PRE-MOBILIZATION SUBMITTALS

- .1 Submittals required for review by the Departmental Representative prior to mobilization to the project site include:
 - .1 Project work schedule
 - .2 Soil sample data as signed, authorized laboratory reports as outlined within section 1.05 of this specification.
 - .3 Authorized seed certificates from an accredited seed laboratory for each plant species specified within the seed mix outlined within Section 32 92 19.13 - Seeding.
 - .4 Documentation regarding the appropriate sourcing and condition of live materials as outlined within Section 32 93 10 - Plant Material.
 - .5 List of Contractor key personnel, their roles and contact information as outlined within Section 01 31 19 - Project Management and Coordination.
 - .6 List of subcontractor, suppliers and consultants, their role(s), and key personnel, including names and contact information, for materials required to complete the scope of work.
 - .7 Plan outlining methods and site layout with which the Contractor shall execute the work.
 - .8 The Contractor Environmental Protection Plan and mitigation strategies as required within Section 01 35 43 - Environmental Procedures.
 - .9 The Contractor Site- Specific Health and Safety Plan, including emergency response plan, for the project in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.07 CONSTRUCTION PHASE SUBMITTALS

- .1 Submittals required for review by the Departmental Representative:
 - .1 Progress reports outlining details of current status of the scope of work, plan for anticipated work, and potential challenges or setbacks which may impact work progress, including potential stoppages of work, their reasoning, and impacts to the work schedule provided by the Contractor.
 - .2 Final as-built drawings.
 - .3 Submit copies of all incident and accident reports.

1.08 MAINTENANCE PHASE SUBMITTALS

- .1 Submit monthly maintenance reports throughout the growing season outlining details of activities conducted onsite as part of regular maintenance and to address deficiencies identified by the Departmental Representative. Include:
 - .1 Dates and details of actions completed onsite
 - .2 Product and material names, application rates, and location(s) used e.g. herbicide application, fencing repair, live plant replacement, etc.

1.09 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 NOT USED

- .1 Not Used.

4 MEASUREMENT AND PAYMENT

4.01 SUBMITTAL PROCEDURE

- .1 This work shall be incidental to contract and shall not be measured for payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the health and safety requirements for the Work.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 REFERENCE STANDARDS

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Alberta
 - .1 Occupational Health and Safety Act, R.S.A. - Updated 2018.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).

1.03 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan within no less than ten (10) days 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 operation and control(s).
 - .3 Onsite Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
 - .4 Site-specific health and safety plan shall be implemented, maintained, and enforced until final demobilization from site.
- .3 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .4 Submit copies of incident and accident reports.
- .5 Submit weekly records of all daily Toolbox Talks.

- .6 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within five (5) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within two (2) days after receipt of comments.
- .7 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .8 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.

1.04 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with five (5) days of contract award.
- .3 Work zone locations include those outlined within Section 01 11 00 - Summary of Work and within the Contract Drawings:
 - .1 Designated access route.
 - .2 Designated work area.
- .4 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.05 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- .2 Daily hazard identification, assessment and control, and health and safety tailgate meeting shall be conducted with all onsite workers prior to commencement of Work.

1.06 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.07 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Departmental Representative.
- .2 The project is located within a National Historic Site and will remain open to the public throughout the project. Public access to and use of the gravel pathway shall be maintained throughout the Work.

1.08 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 and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.09 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta Reg. (2018).
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORSEEN HAZARDS

- .1 When 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 Alberta having jurisdiction and advise Departmental Representative verbally and in writing.

1.11 HEALTH AND SAFETY COORDINATOR

- .1 Employ and assign to Work, a competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
 - .1 Have site-related working experience specific to activities associated with earthworks.
 - .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 Contractor's site-specific Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of the project superintendent.

1.12 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 Alberta having jurisdiction, and in consultation with Departmental Representative.

1.13 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 Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 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.

2 PRODUCTS

2.01 NOT USED

- .1 Not used.

3 EXECUTION

3.01 NOT USED

- .1 Not used.

4 MEASUREMENT AND PAYMENT

4.01 HEALTH AND SAFETY REQUIREMENTS

- .1 Health and safety requirements and Work and materials incidental thereto shall be considered incidental to the contract and will not be measured for payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the environmental procedures which apply to the Work.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
- .4 Conduct Work in accordance with mitigative measures outlined within the Basic Impact Assessment.

1.02 REFERENCE STANDARDS

- .1 Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA) Guidelines Order of 2012, requirements of the Department of Fisheries and Oceans, the Federal Wildlife Act, and subsequent amendments, and Parks Canada's Interim Directive on Implementation of the Canadian Environmental Assessment Act 2012.
- .2 Execution of the work is subject to the provisions within Alberta including the Alberta Water Act, Alberta Public Lands Act, Alberta Weed Act.
- .3 Site activities shall be managed and conducted in accordance with the Alberta wildlife act and the federal migratory birds act.
- .4 Site activities near waterbodies, wetlands, or streams shall be managed and conducted in accordance with the Water Act and Alberta Wetland Policy.
- .5 Site activities shall be managed and conducted in accordance with mitigations outlined within the Basic Impact Assessment associated with the Work, titled "Basic Impact Assessment for the Rocky Mountain House National Historic Site Riverbank Stabilization".

1.03 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.04 ACTION AND INFORMATION SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by the Departmental Representative.
- .3 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction, including protection of the soil surface, and thus potential archaeological resources, from disturbance.
- .4 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .5 Include in Environmental Protection Plan:
 - .1 Name[s] of person[s] responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Name[s] and qualifications of person[s] responsible for orienting/training site personnel.
 - .3 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan (ESC) identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - .6 Drawings indicating locations of proposed material storage areas, structures, sanitary facilities, and stockpiles of soil and rock materials including methods to control runoff and to contain materials on site.
 - .7 Traffic Management Plan including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
 - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
 - .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal.
 - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
 - .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent

introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

- .13 Historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands. This plan must include measures to mitigate potential disturbance to the soil surface by equipment and protocol to be followed in case of accidental historical finds.
- .14 Pesticide treatment plan to be included and updated, as required.
- .15 The Environmental Protection Plan and plans completed as part of it shall comply with mitigations and requirements outlined within the Basic Impact Assessment associated with the Work, titled "Basic Impact Assessment for the Rocky Mountain House National Historic Site Riverbank Stabilization".
- .16 Departmental Representative will review Contractor's Environmental Protection Plan. Revise plan as appropriate and resubmit plan to Departmental Representative.
- .17 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .18 Departmental Representative's review of Contractor's final Environmental Protection Plan should not be construed as approval and does not reduce the Contractor's overall responsibility for environmental protection and mitigation.

1.05 MONITORING

- .1 A Departmental Representative shall be onsite throughout the construction phase and shall conduct inspections at least twice annually throughout the maintenance phase to ensure construction activities and site conditions throughout the duration of this Contract are in compliance with the environmental standards outlined within this specification.
- .2 The Departmental Representative shall monitor the progress of construction, provide guidance, as required, to the Contractor for compliance with environmental protection and meeting design specification needs and identify non-compliance issues at the site.
- .3 Failure to comply with environmental protection measures as identified within the specifications and applicable Federal, Provincial or Municipal regulations may result in suspension of work activities pending rectification, as outlined within this specification (1.13 - Notification of Non-Compliance).

1.06 SITE ACCESS AND PARKING

- .1 The site shall only be accessed along the designated gravel pathway identified within the drawings.

- .2 The Contractor shall formulate a plan, in consultation with the Departmental Representative, for worker transportation to and from the site and determine a location for workers to park construction and personal vehicles.
- .3 Parking along the access route or along the gravel pathway within the work area is not permitted as the route must remain open for public and emergency access and egress.

1.07 FIRE PREVENTION AND CONTROL

- .1 Fires and burning of waste on site is not permitted.
- .2 A fire extinguisher shall be available for use onsite at all times, as well as within each machine and vehicle.
- .3 Construction equipment shall be operated in accordance with manufacturer's specifications and in a manner which prevents ignition of flammable material such as vegetation, or debris.
- .4 Smoking shall be limited to an area identified by the Departmental Representative only, including e-cigarettes. All cigarettes must be extinguished and disposed of in a suitable container and taken offsite for disposal at an appropriate facility.
- .5 In case of fire, the Contractor or worker shall attempt to extinguish the fire if it is safe to do so. The Departmental Representative must be notified immediately of any fire.

1.08 SOIL SURFACE AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties; Removal of trees or plants is not permitted without prior written approval from the Departmental Representative.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes. At the direction of the Departmental Representative, encase plants and trees with protective wood or wire framework as per Section 32 01 90.33 - Tree and Shrub Preservation.
- .3 Stripping of any topsoil and vegetation is not permitted and will lead to a project shutdown until the Departmental Representative has cleared the site for operation again.
- .4 The land surface within the work area and storage/laydown areas must be protected from potential impacts associated with equipment or vehicles. Protective matting, access matting, rig matting or equivalent, shall be used to prevent surface disturbance and compaction.
 - .1 Soil and rock material storage and laydown area(s) shall be lined below the protective matting with impermeable liner to enable the Contractor to remove all soil and rock material from the soil surface without causing damage to the soil surface and vegetation.

1.09 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided for review by the Departmental Representative.
 - .1 Departmental Representative will review Contractor's ESC Plan and provide comments to Contractor within five (5) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within two (2) days after receipt of comments.
 - .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
 - .3 Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.10 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only (from matting along the top of bank).
- .2 All work is to remain above the 1 in 2 flood level at all times. Work below the 1 in 2 is not permitted.
- .3 All work shall remain in compliance with the Alberta Water Act (wetlands shall not be disturbed, damaged or removed and no activities shall occur within waterways).
- .4 Waterways are to be kept free of soil material, waste and debris at all times.
- .5 It is important that sediment is not released into watercourses in levels that are deleterious to fish or that would harmfully alter, disrupt, or destroy fish habitat. If sedimentation is observed, work stoppage shall occur and the Departmental Representative shall be notified immediately. The Departmental Representative shall provide further direction required prior to restarting work.
- .6 In addition to waterways, there is to be no sediment released into areas of vegetation growth that would adversely affect growing or hydraulic conditions.

1.11 WILDLIFE MANAGEMENT

- .1 The Contractor is responsible for ensuring that work onsite is in compliance with the Alberta Wildlife Act and the Migratory Bird Act, including conducting the applicable wildlife and bird sweeps prior to mobilizing to the site.
 - .1 All mitigations identified by the wildlife professional shall be implemented and adhered to onsite.
- .2 Should a migratory or nesting bird be observed during the Work, Work shall stop immediately and Departmental Representative shall be notified.
 - .1 Work shall not resume until the Departmental Representative provides authorization to do so.
 - .2 Good housekeeping shall be maintained onsite to minimize the potential for food, garbage or other attractants to attract or impact wildlife in the area.

1.12 EROSION AND DUST CONTROL

- .1 Erosion control measures that prevent sediment from entering any waterway, waterbody or wetland in the vicinity of the construction site shall be implemented by the Contractor. Measures shall also be effective during times of work stoppage or inactivity onsite.
- .2 On-site sediment control measures required by the Erosion Control Plan prepared by the Contractor shall be installed and functional prior to initiating activities onsite.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads and public gravel roads when hauling associated with the project results in significantly dusty conditions or reduced visibility or other users.
- .4 The regular monitoring and maintenance of all erosion control measures shall be the responsibility of the Contractor. If the design of the control measures is not functioning effectively, they are to be repaired or replaced. The Departmental Representative also monitor and inspect erosion control performance.

1.13 HISTORICAL / ARCHAEOLOGICAL PROTECTION AND CONTROL

- .1 All historical or archaeological objects found are protected under the National Parks Act and Regulations and are the property of Parks Canada Agency.
- .2 Should any "accidental find", or potential "accidental find", including historical, archaeological, or cultural artifact, relic, or objects of potential significance be found onsite, work shall stop immediately and Departmental Representative must be notified.
- .3 The Contractor shall request further direction from the Departmental Representative and shall not resume work until instructed to do so.

1.14 EQUIPMENT

- .1 The Contractor shall ensure that all equipment and materials are clean and free of soil, weeds, seeds and debris prior to mobilization onsite (power washing).
- .2 Fueling shall be completed in a designated area identified by the Contractor, and approved by the Departmental Representative, prior to mobilization to the site.
 - .1 The designated location shall be at least 30 m from a waterbody, wetland or stream and the soil surface shall be protected with matting (e.g. rig matting) and impermeable liner.
 - .2 A spill response plan and spill kit(s) capable of dealing with the largest potential spill capacity of the materials onsite, shall be present at the fueling area
 - .3 Mobile fuel containers must remain within the services vehicle at all times and shall be stored at the location onsite which is furthest away from all waterbodies while not in use.
- .3 Control emissions from equipment in accordance with local authorities' emission requirements.
- .4 Oil changes and lubricant changes shall occur offsite.
 - .1 All waste products must be stored within spill proof containers and disposed of offsite at an approved facility.
- .5 Daily maintenance activities shall occur within the designated fueling location, including, greasing, daily checks for fluid levels, leaks, equipment condition and minor repairs.
- .6 All equipment and equipment operation shall remain within the designated work area footprint, which shall remain enclosed by temporary fencing throughout the construction phase.
- .7 When, in the opinion of the Departmental Representative, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at its expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative.

1.15 SPILL PREVENTION AND CONTROL

- .1 The Contractor shall prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, waterbodies or watercourses that may result in damage to aquatic and riparian habitat.

- .2 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation.
 - .1 Hazardous products shall be stored at least 50 m from waterbodies.
- .3 Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to do so.
- .4 The Departmental Representative shall be notified immediately of any spill.
- .5 In the event of a major spill, a work stoppage shall occur to prioritize spill containment and clean-up.
- .6 The costs associated with a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions and in accordance with the Alberta Tier 1 Soil and Groundwater Remediation Guidelines), shall be the responsibility of the Contractor.
 - .1 Following clean up, the site shall be inspected and confirmatory sampled to confirm the spill has been remediated
 - .2 The spill area shall be sampled and samples submitted to an approved accredited laboratory for analysis. The departmental Representative shall approve the laboratory prior to analysis submission.
 - .3 Parameters shall be selected for analyses based the potential and actual contaminants of concern associated with the spill material. The Departmental Representative shall approve the selected parameters prior to sampling.

1.16 NOTIFICATION OF NON-COMPLIANCE

- .1 The Departmental Representative shall notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, shall inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 The Departmental Representative shall issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Maintain good housekeeping and keep site tidy throughout the day.
- .2 All garbage and waste materials must be hauled off-site for disposal.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .5 Waste Management: separate waste materials for reuse, recycling, and disposal in accordance with Section 01 74 11 - Cleaning.

4 MEASUREMENT AND PAYMENT

4.01 ENVIRONMENTAL PROCEDURES

- .1 All costs for Work associated with environmental procedure requirements and all work and materials incidental thereto shall be made as a lump sum payment.

END OF SECTION

1 GENERAL

1.01 SUMMARY

- .1 This Section references to laws, bylaws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

1.02 RELATED REQUIREMENTS

- .1 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .2 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.03 REFERENCES TO REGULATORY REQUIREMENTS

- .1 Perform Work in accordance with Canadian Environmental Protection Act.
- .2 Perform Work in accordance Federal, Provincial and Municipal health and safety regulations outlined within Section 01 35 29.06 - Health and Safety Requirements.
- .3 Perform Work in accordance federal, provincial and municipal environmental regulations outlined within Section 01 35 43 - Environmental Procedures.
- .4 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.
- .5 Perform Work in accordance with other applicable regulations for environmental resources, including but not limited to, wildlife, wetland, vegetation, and water.

1.04 QUALITY ASSURANCE

- .1 Regulatory Requirements: Except as otherwise specified, the Contractor shall apply for, obtain, and pay all fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:
 - .1 Regulatory requirements and fees in force on date of Bid submission; and,

- .2 Any change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

2.02 NOTICES

- .1 Contractor shall give notices required by regulatory requirements.

2.03 PERMITS/APPROVALS OBTAINED

- .1 Water Act Approval: Departmental Representative has applied for and obtained a Water Act Approval.
- .2 First Nations Consultation: Departmental Representative has consulted with and notified First Nations of this project.
- .3 Occupancy Permits are not required as the Work shall occur within the property of the Departmental Representative.

3 EXECUTION

3.01 NOT USED

- .1 Not Used.

4 MEASUREMENT AND PAYMENT

4.01 REGULATORY REQUIREMENTS

- .1 Regulatory requirements and all work and materials incidental thereto shall be considered incidental to the contract and will not be measured for payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the quality control for the duration of the contract period.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 MEASUREMENT PROCEDURES

- .1 This work shall be incidental to the contract and will not be measured for payment.

1.03 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.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.04 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies shall be engaged by the Contractor for purpose of inspecting and/or testing portions of Work, such as soil and seed analysis. Costs for such services will be borne by the Contractor.

- .2 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative.

1.05 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work.

1.06 REJECTED WORK

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

1.07 REPORTS

- .1 Submit electronic copies of inspection and test result reports from independent agencies to Departmental Representative.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 INSPECTIONS

- .1 The Departmental Representative shall conduct inspections at the following milestones to confirm compliance with the Contract prior to proceeding with subsequent Work:
 - .1 Completion of infill and willow staking within the riprap.
 - .2 Completion of subsoil placement.
 - .3 Completion of topsoil placement.
 - .4 Completion of seeding.
 - .5 Placement of COIR matting and arrangement of live plants prior to installation.
 - .6 Completion of live plant installation.
 - .7 Site condition following equipment and material removal from site.
 - .8 Throughout the maintenance period; before and after maintenance is performed by the Contractor.

4 MEASUREMENT AND PAYMENT

4.01 QUALITY CONTROL

- .1 Quality control and all work and materials incidental thereto shall be considered incidental to the contract and will not be measured for payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the construction facilities required for the Work.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

1.03 INSTALLATION AND REMOVAL

- .1 Provide construction facilities in order to execute work expeditiously.
- .2 Remove from site all such work after use.

1.04 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that may endanger Work or the public.

1.05 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
- .2 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.06 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain public access along the gravel pathway.
- .2 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public in accordance with Section 01 55 26 - Traffic Control.

1.07 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Protect all existing vegetation from damage during the performance of the Work and maintain tree protection fences in accordance with Section 32 01 90.33 and as detailed on the Contract Drawings.
- .3 Be responsible for damage incurred.
- .4 Ensure all Archeological Sites are protected throughout the duration of the construction and maintenance period in accordance with Section 01 14 00 - Work Restrictions and 01 35 43 - Environmental Procedures.

1.08 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide traffic control measures in accordance with Section 01 55 26 - Traffic Control.

1.09 TEMPORARY FENCING

- .1 Supply, install and maintain temporary fencing to enclose work areas and protect the public.
- .2 Provide secure fabric and /or wire fencing that shall permit visibility to and from the work site.
- .3 Temporary fencing to be at least 1500mm high.
- .4 Obtain the approval of the Departmental Representative for the type and location of such fencing.
- .5 Where wire ties are used to secure the fence, locate the tie on the construction side of the fence.
- .6 Ensure that temporary fence legs do not project into public use areas.

1.10 CONSTRUCTION PARKING

- .1 Parking shall only be permitted in location(s) designated by the Departmental Representative. Parked vehicles or equipment shall not disrupt performance of Work, access/egress or public access outlined within Section 01 14 00 - Work Restrictions. Parking areas shall comply with requirements outlined within Section 01 52 00 - Environmental Procedures as applicable.
- .2 Provide and maintain adequate access to project site.
- .3 When using existing roads and pathways for access to project site, maintain such roads and pathways for duration of Contract and make good damage resulting from Contractors' use of roads.

1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.12 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances and Section 01 35 43 - Environmental Procedures.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.13 CONSTRUCTION SIGNAGE

- .1 Construction signage shall be completed and maintained in accordance with Section 01 55 26 - Traffic Control.

1.14 CLEAN-UP

- .1 Complete in accordance with Section 01 74 11 - Cleaning.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Complete in accordance with Section 01 35 43 - Environmental Procedures.

4 MEASUREMENT AND PAYMENT

4.01 CONSTRUCTION FACILITIES

- .1 All costs for providing, installing and maintaining construction facilities and all work and materials incidental thereto shall be made as a lump sum payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the traffic control measures for the duration of the contract period.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 REFERENCE STANDARDS

- .1 Alberta Infrastructure and Transportation
 - .1 Traffic Accommodation in Work Zones -[08].
- .2 Manual of Uniform Traffic Control Devices for Canada, (MUTCD) distributed by Transportation Association of Canada.

1.03 QUALITY CONTROL

- .1 All quality control to be performed by the Contractor. Refer to Section 01 45 00 - Quality Control.

1.04 PROTECTION OF PUBLIC TRAFFIC

- .1 The Contractor shall develop and implement a Traffic Management Plan in accordance with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment. The Traffic Management Plan will include plans specific to each detour and access point required to perform the Work of this contract.
 - .1 Departmental Representative will review Contractor's Traffic Management Plan. Revise plan as appropriate and resubmit plan to Departmental Representative.
 - .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
 - .3 Departmental Representative's review of Contractor's final Traffic Management Plan should not be construed as approval and does not reduce the Contractor's overall responsibility for environmental protection and mitigation.

- .2 When working on travelled way:
 - .1 Place equipment in position to minimize interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
 - .3 Do not leave equipment on travelled way overnight.
- .3 Close lanes of road only after receipt of written approval from Departmental Representative.
 - .1 Before re-routing traffic erect suitable signs and devices to Alberta Traffic control standard - Manuals and guidelines.
- .4 Keep travelled way graded, free from pot holes and of sufficient width.
- .5 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, except where other means of road access exist that meet approval of Departmental Representative.

1.05 INFORMATIONAL AND WARNING DEVICES

- .1 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 All traffic and warning signs shall be either bilingual (French/English) or of an illustrative or symbolic type. For bilingual signs, the English and French message shall be of equal letter size and at the same elevation, with English on the left and French on the right. Assistance in translation of traffic and warning signs may be obtained from the Departmental Representative. All signs to be reviewed by Departmental Representative prior to use.
- .3 Supply and erect signs, delineators, barricades and miscellaneous warning devices to Alberta Traffic control standard - Manuals and guidelines.
- .4 Place signs and other devices in locations recommended in Alberta Traffic control standard - Manuals and guidelines and on the Construction Drawings.
- .5 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.

- .6 Continually maintain traffic control devices in use:
 - .1 Check signs daily for legibility, damage, suitability and location.
 - .2 Clean, repair or replace to ensure clarity and reflectance.
 - .3 Remove or cover signs which do not apply to conditions existing from day to day.

1.06 CONTROL OF PUBLIC TRAFFIC

- .1 Provide competent flag personnel, trained and properly equipped in accordance with requirements of Acts, Regulations and By-Laws in force for regulation of traffic for situations as follows:
 - .1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .3 When personnel or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
 - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - .5 For emergency protection when other traffic control devices are not readily available.
 - .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
 - .7 Delays to public traffic due to contractor's operators: 10 minutes maximum.
 - .8 Flag person(s) shall be posted at locations outlined within the Traffic Management Plan.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 NOT USED

- .1 Not Used.

4 MEASUREMENT AND PAYMENT

4.01 TRAFFIC CONTROL

- .1 All costs for providing and maintaining traffic control and all work and materials incidental thereto shall be made as a lump sum payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the cleaning and waste management for the duration of the contract period.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 REFERENCE STANDARDS

- .1 Canadian Construction Association (CCA)
 - .1 CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.

1.03 PROJECT CLEANLINESS

- .1 All vehicles, equipment, matting, and materials entering site shall be free of soil, seeds, other debris, oil, fuel and other chemicals or potential contaminants. Issues associated with foreign materials brought into the site by the Contractor shall be the responsibility of the Contractor to remedy to pre-Work conditions.
- .2 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Departmental Representative or other Contractors.
- .3 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .4 Clear snow and ice from access to site, bank/pile snow in designated areas only.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Provide on-site containers for collection of waste materials and debris.
- .7 Provide and use marked separate bins for recycling.
- .8 Dispose of waste materials and debris off site at an approved/authorized waste and recycling facility.
- .9 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

- .10 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .11 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .12 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .13 Schedule cleaning operations so that resulting dust, debris and other contaminants shall not fall on wet, newly painted surfaces nor contaminate building systems.

1.04 EQUIPMENT CLEANING

- .1 All equipment and matting entering site shall be free of soil, seeds and other debris.
- .2 Equipment and matting shall be clean and free of oil, fuel or other chemicals or potential contaminants.

1.05 FINAL CLEANING

- .1 When Work is completed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean.
- .3 Prior to final review and inspection remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by Departmental Representative or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Fully clean any existing structure(s) within the Rocky Mountain House National Historic Site that has been impacted by the construction works.
- .8 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds that has been impacted by the construction works.
- .9 Remove dirt and other disfiguration from exterior surfaces.

- .10 Sweep and wash clean paved areas.
- .11 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .12 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

1.06 WASTE SOURCE SEPARATION

- .1 Contractor to develop process for separation of reusable and recyclable materials from waste intended for landfill.
- .2 Provide sufficient on-site facilities and containers for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .3 Locate containers to facilitate deposit of materials without hindering daily operations.
- .4 Provide training for contractor, sub-contractors and workers in handling and separation of materials for reuse and/or recycling.
- .5 Locate separated material(s) in area(s) which minimizes material damage.
- .6 Clearly and securely label containers to identify types/conditions of materials accepted and assist contractor, sub-contractors and workers in separating materials accordingly.
- .7 Monitor on-site waste management activities by conducting periodic site inspections to verify: state of signage, contamination levels, bin locations and condition, personnel participation, use of waste tracking forms and collection of waybills, receipts and invoices.
- .8 On-site sale of salvaged materials is not permitted unless authorized in writing by Departmental Representative and provided that site safety regulations requirements are adhered to.

1.07 WASTE MANAGEMENT AND DISPOSAL

- .1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

1.08 QUALITY ASSURANCE

- .1 After award of Contract, a mandatory site examination shall be held for this Project for Contractor responsible for construction waste management.
 - .1 This inspection shall take place on-site after the project start-up meeting.
- .2 Waste Management Coordinator is to provide an update on status of waste diversion and management activities at each meeting.
- .3 Inspection of the site following completion of construction shall be conducted after the site clean up has been completed to the satisfaction of the Departmental Representative.

1.09 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal do not become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .9 Separate and store materials produced during project in designated areas.
- .10 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
 - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.10 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner or any other construction materials into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis.

1.11 SCHEDULING

- .1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 NOT USED

- .1 Not Used.

4 MEASUREMENT AND PAYMENT

4.01 CLEANING

- .1 Cleaning and all work and materials incidental thereto shall be considered incidental to the contract and shall not be measured for payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the closeout procedures at the end of the construction period and for the three (3) year maintenance period (beginning at Construction Closure and ending at the end of the growing season of the third year).
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 REFERENCE STANDARDS

- .1 Canadian Environmental Protection Act (CEPA).

1.03 ADMINISTRATIVE REQUIREMENTS - CONSTRUCTION PHASE

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative inspection.
 - .2 Departmental Representative Inspection:
 - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit certificates and report(s) that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Certificates required by the Departmental Representative submitted.
 - .4 Work: complete and ready for Construction Completion inspection.
 - .4 Construction Completion Inspection:
 - .1 When completion tasks are done, request Construction Completion inspection of Work by Departmental Representative.
 - .2 When Work is incomplete according to Departmental Representative, complete outstanding items and request re-inspection.

- .5 Construction Completion: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract performed.
- .6 Commencement of Maintenance Period: date of Departmental Representative's acceptance of construction completion to be date for commencement for maintenance period.
 - .1 Three (3) year Maintenance Phase commences extending through to the end of the following three growing seasons (ending at the end of the third year following Maintenance Phase closeout procedures).

1.04 ADMINISTRATIVE REQUIREMENTS - MAINTENANCE PHASE

- .1 Closeout inspection and submittals shall be completed at the end of the growing season for each maintenance year, following completion of Work:
 - .1 Year 1 Maintenance
 - .2 Year 2 Maintenance
 - .3 Year 3 Maintenance
- .2 Acceptance of Maintenance Work Procedures:
 - .1 Contractor's Inspection: Contractor to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative inspection.
 - .2 Departmental Representative Maintenance Year Inspection:
 - .1 When completion tasks are done, request inspection of Work by Departmental Representative.
 - .2 When Work is incomplete according to Departmental Representative, complete outstanding items and request re-inspection.
 - .3 Maintenance Year Completion: when Departmental Representative considers deficiencies, defects corrected, reports have been received and reviewed, and requirements of Contract performed.

- .4 Final Maintenance Acceptance:
 - .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met.
 - .2 When Work deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

1.05 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
 - .2 Waste Management: remove and dispose of all waste in accordance with Section 01 74 11 - Cleaning.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 NOT USED

- .1 Not Used.

4 MEASUREMENT AND PAYMENT

4.01 CLOSEOUT PROCEDURES

- .1 Closeout procedures and all work and materials incidental thereto shall be considered incidental to the contract and will not be measured for payment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 This section specifies the closeout submittals for the duration of the contract period.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.

1.02 REFERENCE STANDARDS

- .1 Canadian Environmental Protection Act (CEPA).
 - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.03 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-maintenance Period Meeting:
 - .1 Convene meeting one (1) week prior to contract completion with contractor's representative and Departmental Representative, in accordance with Section 01 31 19 - Project Management and Coordination to:
 - .1 Verify project requirements.
 - .2 Review manufacturer's installation instructions and maintenance requirements.
 - .2 Departmental Representative to establish communication procedures for:
 - .1 Notifying construction defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.

- .3 Provide evidence, if requested, for type, source and quality of products supplied.
- .4 Defective products shall be rejected, regardless of previous inspections. Replace products at own expense.

1.05 FORMAT

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

1.06 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for each volume: Provide:
 - .1 Title of project.
 - .2 Date of submission.
 - .3 Names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .4 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts and systems.

- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.07 AS-BUILT DOCUMENTS AND SAMPLES

- .1 Maintain at site for Departmental Representative one (1) record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders.
 - .5 Other Modifications to Contract.
 - .6 Shop drawings as required
 - .7 Copy of Approved Work Schedule.
 - .8 Applicable regulatory approvals and/or permits.
 - .9 Health and Safety Plan, daily Toolbox Talks, and Other Safety Related Documents.
 - .10 Environmental Protection Plan
 - .11 Other documents as specified.
- .2 Store record documents (as-builts) 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 Departmental Representative.

1.08 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
 - .4 Referenced Standards to related shop drawings and modifications.

- .4 Specifications: 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, field test records, required by individual specifications sections.
- .6 Provide digital photos for site records of the of site conditions:
 - .1 Prior to Work beginning.
 - .2 During Work activities.
 - .3 At Construction Completion.
 - .4 Of Maintenance activities.
 - .5 At Maintenance Completion.

1.09 INSPECTIONS

- .1 Conduct joint inspection with the Contractor and Departmental Representative immediately following construction completion (once equipment has been removed) and annually during the three growing season maintenance period, measured from time of acceptance, by Departmental Representative. Requirements for repair or replacement shall be discussed during the inspection.
- .2 Live plant material: each type of live plant and total number of live plants shall be guaranteed to maintain at least 80% survivability within the Contract period ending at closeout of the final maintenance period.
 - .1 Replacement of live plant material required due to mortality exceeding 20 % shall be completed at the cost of the Contractor.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

4 MEASUREMENT AND PAYMENT

4.01 CLOSEOUT SUBMITTALS

.1 Closeout submittals and all work and materials incidental thereto shall be considered incidental to the contract and shall not be measured for payment.

END OF SECTION

1 GENERAL

1.01 SCOPE OF SECTION

- .1 This section specifies the fill materials required for infilling of the riprap and placement of these materials.

1.02 RELATED REQUIREMENTS

- .1 The General Conditions of Contract, Division 01 General Requirements and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .2 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
 - .1 Section 01 14 00 - Work Restrictions
 - .2 Section 01 35 43 - Environmental Procedures
 - .3 Section 01 74 11 - Cleaning
 - .4 Section 31 37 00 - Riprap
 - .5 Section 31 32 19.16 - Soil Stabilization
 - .6 Section 32 91 19.13 - Topsoil and Subsoil Placement and Grading
 - .7 Section 32 92 19.13 - Seeding
 - .8 Section 32 01 90 - Landscape Maintenance
 - .9 Section 32 93 10 - Plant Material

1.03 REFERENCE STANDARDS

- .1 Material Specifications for Aggregates OPSS 1004 for winter sand (maximum size only).

1.04 WORK RESTRICTIONS

- .1 All existing soil surfaces on site shall be matted and protected from disturbance, including rutting, as per Section 01 14 00 - Work Restrictions. Any disturbance of soil will result in the immediate shut down of the project and notification of the Departmental Representative.
- .2 Placement and positioning of existing riprap shall not be disturbed during the Work.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

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

1.06 CLEANING

- .1 Cleaning and waste management shall be completed in accordance with Section 01 74 11 - Cleaning.

2 PRODUCTS

2.01 MATERIALS

- .1 Washed gravel 100% passing through a 60mm sieve and 0% passing through a 10mm sieve size.
- .2 Sand with 100% passing through a 9.5mm sieve.
- .4 Live stakes: supplied by the Departmental Representative
 - .1 Wooden survey stakes shall be used to mark planting locations and to create pilot holes for live stakes.
 - .2 Refer to the Contractor Drawings and associated notes/legend for quantities of live stakes for installation within the riprap
 - .3 Storage and care of live stakes onsite are the responsibility of the Contractor and shall be completed as per Section 32 93 10 - Plant Material.

3 EXECUTION

3.02 MATERIAL STORAGE

- .1 All sand and gravel stockpiled materials shall be placed in designated areas as directed by the Departmental Representative and on protective matting (rig matting or approved equivalent) and associated liner in accordance with Section 31 32 19.16 - Soil Stabilization.
- .2 Soil, gravel and sand stockpiled for temporary storage onsite shall be positioned no closer than 1 metre between the base of piles to mitigate the potential for admixing.
- .3 Live stakes shall be stored onsite in water as specified within Section 32 93 10 - Plant Material.

3.02 SITE PREPARATION

- .1 All equipment shall be ready for work in proximity to water with associated environmental controls in place in accordance with Section 01 35 43 - Environmental Procedures.
 - .1 Protect slopes and banks and perform work in accordance with Federal, Provincial and Municipal regulations.
- .2 Protective matting and associated liner, and tree and shrub protection mitigations shall be in place prior to commencing riprap infilling.

3.03 INFILL AND LIVE STAKE INSTALLATION

- .1 In incremental amounts, using vibration and manual guidance, fill all possible voids within the riprap with washed gravel and sand (above the 1:2 year flood level).
 - .1 Washed gravel shall be used to fill large voids that require larger materials to effectively fill the voids.
 - .2 Sand shall be used throughout the riprap to fill all possible voids.
 - .3 The average depth of sand has been calculated at 100mm across the site; however, it is expected that the sand shall just reach the surface of the rocks once fully installed.
- .2 Concurrently with sand and gravel, survey stakes shall be positioned manually into voids within the riprap to demark locations for live stake installation and act as pilot holes.
 - .1 Insert survey stakes for riprap stake planting (Section 32 93 10 - Plant Material) and for live stakes required for wattle installation (Section 31 32 19.16 - Soil Stabilization).
 - .2 Live stake installation shall occur following riprap infill by replacing survey stakes with live stakes. Refer to additional installation, handling and storage specifications for live stakes within Section 32 93 10 - Plant Material.
 - .3 At the discretion of the contractor, live stakes within the rip rap may be installed after subsoil and topsoil placement based on field conditions. The Contractor approach shall be discussed with the Departmental Representative prior to beginning riprap infilling.
- .3 Infill materials shall be filled into voids until no further material can be inserted into the riprap.

3.04 EROSION CONTROL MATTING KEY-IN

- .1 Following infill placement, erosion control matting (COIR matting) shall be placed along the toe slope of the work area as per specifications outlined within Section 31 32 19.16 - Soil Stabilization.

3.05 QUALITY CONTROL

- .1 Infill material and spaces to be filled within the riprap to be inspected by the Departmental Representative prior to beginning placement of subsoil.
- .2 No existing riprap shall be moved.

4 MEASUREMENT AND PAYMENT

4.01 RIPRAP INFILL

- .1 Imported washed gravel shall be placed into large voids. Payment will be by the cubic metre price for the specified number of cubic metres to be used, and will include all costs for loading, hauling, screening, dumping, spreading, vibrating into voids, placement and leveling; and all work and materials incidental thereto. Measurement shall be made of the cubic metre loose truck box measure.
- .2 Imported sand shall be placed into to voids within the riprap. Payment will be by the cubic metre price for the specified depth, and will include all costs for loading, hauling, screening, dumping, spreading, vibrating into voids, placement and leveling; and all work and materials incidental thereto. Measurement will be made of the cubic metre loose truck box measure.
- .3 Live stakes shall be provided by the Departmental Representative. The Contractor is responsible for onsite storage, hauling onsite, installation, clean up and all work and materials incidental thereto. Measurement and payment shall be completed according to Section 32 93 10 - Plant Material.

END OF SECTION

1 GENERAL

1.01 SCOPE OF SECTION

- .1 This section specifies the requirements for:
 - .1 Protective Matting and Liner (Work Space and Laydown)
 - .2 Wattles
 - .3 Silt Fence
 - .4 Erosion Control Matting (COIR Matting)

1.02 RELATED REQUIREMENTS

- .1 The General Conditions of Contract, Division 01 General Requirements and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .2 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
 - .1 Section 31 00 99 - Riprap Infill
 - .2 Section 32 91 19.13 - Topsoil and Subsoil Placement and Grading
 - .3 Section 01 74 11 - Cleaning
 - .4 Section 01 35 43 - Environmental Procedures
 - .5 Section 32 93 10 - Plant Material

1.03 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A 123/A 123M-[09], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM D 4491-[99a(2009)], Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .3 ASTM D 4595-[09], Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .4 ASTM D 4716-[08], Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - .5 ASTM D 4751-[04], Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-[2004], Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.2-[M85], Methods of Testing Geosynthetics - Mass per Unit Area.
 - .2 No.3-[M85], Methods of Testing Geosynthetics - Thickness of Geotextiles.
 - .3 No.6.1-[93], Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.

- .4 No.7.3-[92], Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
- .5 No. 10-[94], Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for geotextiles and biodegradeable fibre products and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop drawing:
 - .1 Provide following samples one (1) week prior to beginning Work:
 - .1 Minimum length of 2 m of roll width of geotextile.
 - .2 Methods of joining.
- .4 Test and Evaluation Reports:
 - .1 Submit copies of mill test data and certificate at least one (1) week prior to start of Work.

1.05 WORK RESTRICTIONS

- .1 All existing soil surfaces on site shall be matted and protected from disturbance, including rutting, as per Section 01 14 00 - Work Restrictions.
- .2 Protective matting shall be installed in a manner which ensures the soil surface is protected prior to equipment accessing the area. Any disturbance of the surface shall result in the immediate shutdown of the project and notification of the Departmental Representative.

1.06 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and handling requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect geotextiles from direct sunlight and UV rays.
 - .3 Replace defective or damaged materials with new at no cost to the Departmental Representative.

1.07 CLEANING

- .1 Cleaning and waste management shall be completed in accordance with Section 01 74 11 - Cleaning.
- .2 All protective matting and erosion control materials shall be clean and free of soil, seeds, debris and other potential contaminants prior to entering the site.

2 PRODUCTS

2.01 SOIL STABILIZATION MATERIAL

2.01-1 PROTECTIVE MATTING AND ASSOCIATED LINER

- .1 Liner: Specific product shall be selected by the Contractor and provided for review by the Departmental Representative at least one (1) week prior to work commencement.
 - .1 Use a high strength woven geotextile or approved equivalent product capable of preventing sand, gravel, and soil from reaching the undisturbed ground on site beneath the protective matting and between cracks in the protective matting.
 - .2 Product shall be strong enough to withstand manipulation with equipment and weight of loose sand, gravel, and other soil material to allow for complete clean up following matting removal.
- .2 Protective Matting:
 - .1 The Contractor shall select the appropriate matting (access matting, rig matting, combination of, or approved equivalent) to ensure that soil surface on the site is not disturbed during the construction process. The contractor is responsible to ensure protective matting is of sufficient quality and durability that the soil surface is not damaged by their equipment, materials or other entities. Individual mat size:
 - .1 Width: 8 ft (2.4 m) minimum.
 - .2 Length: 14 ft (4.2 m) minimum.
 - .3 Thickness: 15 cm (6 inches) minimum.
 - .2 The contractor shall provide a plan, including the specifications of the protective matting and liner, shop drawings and installation strategy, to the Departmental Representative at least one (1) week prior to Work commencement for review.
 - .3 Departmental Representative will review Contractor's protective matting plan. Revise plan as appropriate and resubmit plan to Departmental Representative.

- .4 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .5 Departmental Representative's review of Contractor's protective matting plan should not be construed as approval and does not reduce the Contractor's overall responsibility for protection of the soil surface.

2.01-2 WATTLE

- .1 Wattle: biodegradable fibre fabric, supplied in rolls.
 - .1 Diameter: 12 inches minimum.
 - .2 Length: 10 ft minimum.
 - .3 Netting: 100% COIR.
- .2 Composed of: 100% biodegradable materials (no synthetic nettings and the log must be filled with coconut or wood chips or an approved equivalent).
- .3 Live Stakes: supplied by Departmental Representative. Refer to Section 32 93 10 - Plant Materials.
 - .1 Wooden survey stakes shall be used to mark planting locations and to create pilot holes for live stakes during riprap infilling (Section 31 00 99 - Riprap Infill).

2.01-3 SILT FENCE

- .1 Geotextile: supplied in rolls.
 - .1 Width: [0.91] m minimum.
 - .2 Length: [30.48] m minimum.
 - .3 Composed of: minimum 85% by mass of polypropylene, with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 60 days.
- .2 Physical properties:
 - .1 Grab Tensile strength (in any principal direction) to ASTM D-4632, ASTM D-4833.
 - .1 Grab Tensile strength: minimum 550x550 N.
 - .2 Puncture Strength: minimum 285 N.
 - .2 Mullen Burst (ASTM D-3786) Minimum 2060 kPa
 - .3 Trapezoidal Tear (ASTM D-4533) Minimum 285 N.
- .3 Hydraulic properties:
 - .1 Apparent opening size (AOS): minimum 0.600mm.
 - .2 Permittivity (ASTM D 4491): 0.1 sec⁻¹
 - .3 Water Flow Rate (ASTM D-4491): 325 l/min/m²
- .4 Wood stakes (to secure fencing) to factory specifications or no more than 2 m spacing if no factory specifications exist.

2.01-4 EROSION CONTROL MATTING

- .1 Geotextile: biodegradable fibre fabric, supplied in rolls.
 - .1 GeoCOIR Dekowe 700 or approved equivalent.
 - .2 Width: 2 m minimum.
 - .3 Length: 40 m minimum.
 - .4 Composed of: 100% biodegradable coir netting 23oz/sy (700g/sm)
- .2 Physical properties:
 - .1 Tensile strength and elongation (in any principal direction):
 - .1 Tensile strength: minimum 1488x1032lbs/ft.
 - .2 Open Area:50%
 - .3 Mass/Unit Area 700g/sm
 - .4 Shear Stress 4.5psf
 - .5 Functional Longevity 24-36 months
 - .6 Thickness 0.35 inches
- .3 Biodegradable pins to securing erosion control matting.
- .4 Class 2 riprap (refer to Section 31 37 00 - Riprap).

3 EXECUTION

3.01 SITE PREPARATION

- .1 Verification of Conditions:
 - .1 Before commencing work, conduct, with the Departmental Representative, a condition survey of existing structures, trees and plants, bank area, fencing, bank protection, survey bench marks, monuments and any other features which may be relevant to the work
 - .2 Before commencing work establish locations of buried services on and adjacent to site by conducting an Alberta One Call.
- .2 Locate and protect all archeological dig pits, fencing, and other structures within the project footprint prior to commencement of work.

3.02 PROTECTIVE MATTING AND ASSOCIATED LINER

3.02-1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for protective matting placement installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.02-2 INSTALLATION

- .1 Install liner (a layer of high strength woven geotextile or approved equivalent) across the soil surface which will be covered with protective matting. Liner shall be installed to catch all sand, gravel, soils and other materials that may fall through and between the cracks in the protective matting.
- .2 Overlap ends of liner by at least 0.5 m.
- .2 Place protective matting on top of the liner using equipment staged from the gravel pathway and/or previously matted area(s). Use of tag lines and manual direction may be required and shall be conducted in accordance with health and safety requirements (Section 01 35 29.06 - Health and Safety Requirements).
- .3 Ensure that the matting and liner extends past the work space far enough to ensure no soil or other materials lands on undisturbed ground or near any archeological dig locations.
- .4 Protective matting shall be installed in all areas where equipment and materials shall be stored onsite and areas where equipment will be working. Equipment should be able to walk along the continuous matting without disturbing the soil surface.
- .5 Removal of protective matting and fabric must be completed in a manner to ensure all sand, gravel, soil, and other debris are removed from site.

3.03 WATTLE

3.03-1 EXAMINATION

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

3.03-2 INSTALLATION

- .1 Place wooden survey stakes in any large voids during riprap infilling where the wattle will be installed to mark the locations and act as pilot holes.
 - .1 Stakes shall be placed along the riprap bank at the toe slope of the work area (just above the 1 in 2 year high water mark) as shown in the Contract Drawings.
 - .2 Stakes shall be placed up the bank to the top of bank along both upstream and downstream ends of the project as shown in the Contract Drawings.
- .2 Infill riprap with washed gravel and sand according to Section 31 32 19.16 - Riprap Infill.
- .3 Manually place the wattle along the slope snug to the ground so that there are no gaps or voids beneath it (flat on the infilled riprap surface).
- .4 Install live stakes to secure the wattle into pilot holes created by removal of the survey stakes.
 - .1 Minimum interval spacing of 1 m, or, if stakes installed on each side of the wattle 2 m spacing is sufficient.
 - .2 Live stakes may be installed through the wattle.
 - .3 If required, additional 2x2 inch wooden stakes can be installed to supplement live stakes.
- .5 Tie the wattle with a biodegradable rope to the live/wooden stakes (weave) to secure its placement.
- .6 Taper subsoil and topsoil placement depths to the wattle so that its depth is 1/3 the height of the wattle in accordance with Section 32 91 19.13 - Subsoil and Topsoil Placement and Grading.

3.04 SILT FENCE

3.04-1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for silt fence installation in accordance with manufacturer's written instructions. It is expected that the silt fence seal shall require temporary weights to be placed as digging it into the ground shall not be possible in many locations on the riprap. However, where voids between riprap are filled then fill materials may be placed over the silt fence to prevent silt from escaping under the fence.
 - .1 Visually inspect substrate in presence of Departmental Representative.

- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and receipt of written approval to proceed by Departmental Representative.

3.04-2 INSTALLATION

- .1 Silt fence shall be placed below the straw wattle (on the river side) and secured by wooden stakes or a Departmental Representative approved substitute into the riprap to provide a temporary barrier to protect from any sediment movement during construction.
- .2 Infill riprap with washed gravel and sand according to Section 31 32 19.16 - Riprap Infill.
- .3 Install the silt fence to manufacturer specifications with the fence buried into the sand and gravel between voids where possible. Where not possible place rocks or other materials on the silt fence to weigh it down.
- .4 Stakes shall be installed at approximately 2000mm spacing or at manufacturer specification.
- .5 Install the silt fence so it extends past the end of the soil placement area by at least 3 m and then up the bank slope toward the top of bank. Refer to the Contract Drawings.

3.05 EROSION CONTROL MATTING (COIR Matting)

3.05-1 EXAMINATION

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

3.05-2 INSTALLATION

- .1 Following riprap infill, key in the bottom of the erosion control matting by placing the erosion control matting along the toe of the work area with 1000mm layer above the straw wattle and the remainder of the matting piece laying below the straw wattle (this section will later be flipped backward over the bank following soil placement).
- .2 Secure the toe of the erosion control matting by placing subsoil and topsoil according to Section 32 91 19.13.
- .3 Complete the rest of the subsoil and topsoil placement along the bank area according to Section 32 91 19.13.
- .4 Following subsoil and topsoil placement, flip back and roll the erosion control matting which was secured at the toe of the slope up the soiled slope. Start at the downstream end and work to the upstream end of the Work area.
- .5 Continue covering the soiled bank area with erosion control matting ensuring a minimum of 300mm overlap between roll endings. Work from the bottom of the slope upward to the top of bank and from the downstream end of the work area to the upstream end of the bank.
 - .1 Ensure the matting extends past the upstream end of the soiled slope area by at least 500mm.
- .6 Place riprap at least once every 2 m on the matting at the toe of the slope to secure in place (until vegetation established).
- .7 Place riprap at least every 1m along the upstream side.
- .8 Pin matting with securing pins at 1000 mm intervals or more frequently as specified by the manufacturers' specifications.

4 MEASUREMENT AND PAYMENT

4.01 SOIL STABILIZATION

- .1 Protective matting and associated liner shall be measured as a lump sum payment. Payment shall be a lump sum and shall include all costs for loading, hauling placement, removal and disposal and all work and materials incidental thereto. It is up to the contractor to determine how much protective matting they require in order to complete the project without disturbing the soil surface.
- .2 Measure wattle in meters of length covered by material. Payment shall be made on a linear meter basis of installed material on the bank and shall include delivery, storage, placement, anchoring, associated labor and all work and materials incidental thereto. No allowance shall be made for seams and overlaps.

- .3 Measure silt fence in meters of length covered by material. Payment shall be made on a linear meter basis and shall include delivery, storage, placement, anchoring, labour; and all work and materials incidental thereto. No allowance shall be made for overlaps or seams.

- .4 Measure erosion control matting in square metres of surface covered by material. Payment shall be made on a square meter basis and shall include delivery, storage, placement, anchoring, associated labor and all work and materials incidental thereto. No allowance shall be made for seams and overlaps.

END OF SECTION

1 GENERAL

1.01 SCOPE OF SECTION

- .1 This section specifies the riprap requirements and placement of riprap to secure erosion control matting.

1.02 RELATED REQUIREMENTS

- .1 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .2 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
 - .1 Section 31 00 99 - Riprap Infill
 - .2 Section 31 32 19.16 - Soil Stabilization
 - .3 Section 32 01 90 - Landscape Maintenance
 - .4 Section 32 91 19.13 - Topsoil and Subsoil Placement and Grading
 - .5 Section 32 92 19.13 - Seeding

1.03 REFERENCE STANDARDS

- .1 Not Used

1.04 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Cleaning.
- .2 Divert left over aggregate materials from landfill to local quarry or facility for reuse as approved by Departmental Representative.

2 PRODUCTS

2.01 STONE

- .1 Hard, dense, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended:
 - .1 Class II riprap for anchoring matting:
 - .1 Not more than 10% of total volume of stones with individual diameter less than 150 mm.
 - .2 Not less than 50% of total volume of stones with individual diameter of less than 300 mm or more.
 - .3 No more than 10% of total volume of stones will have a diameter of 400 mm.

3 EXECUTION

3.01 PLACING

- .1 Riprap shall be placed from the top of bank using equipment, with the assistance of workers, along the perimeter of all erosion control matting (i.e. COIR matting) to anchor it down to the riprap on the sides and bottom edge of the work area.
- .2 Riprap placement shall occur at regular intervals along the perimeter of the work area in accordance with Section 31 32 19.16 - Soil Stabilization. Riprap shall be positioned to anchor the toe of the matting and prevent shifts or movement.

4 MEASUREMENT AND PAYMENT

4.01 RIPRAP

- .1 Measure riprap without cement mortar in cubic metres of material placed.
- .2 Pricing shall include all costs for loading, hauling, dumping, placing and movement on site; and all work and materials incidental thereto.

END OF SECTION

1 GENERAL

1.01 SCOPE OF SECTION

- .1 This provision is for the maintenance for the erosion control materials, seeded areas and live plantings (trees, shrubs, perennials and live stakes).
 - .1 The Contractor shall perform the required maintenance in the period between completion of construction and final maintenance acceptance.
 - .2 This shall be a 3-year maintenance period beginning at the completion of construction and ending at the end of the growing season of the third year, once annual maintenance activities have been completed to the satisfaction of the Departmental Representative and the closeout submittals completed.
- .2 Landscape Maintenance will include, but not be limited to:
 - .1 Watering (during construction and during the subsequent growing seasons to the end of the maintenance phase)
 - .2 Weeding and weed management on a regular schedule to ensure vigorous plant and seed establishment.
 - .2 Contractor to protect plant material from wildlife during the plant establishment period and thereafter during the maintenance period. The method of plant protection shall be approved by the Departmental Representative prior to installation. The contractor shall supply shop drawings prior to installation.
 - .3 Removing rubbish from over the construction site limits on a monthly basis during the growing season.
 - .4 Remove weeds, as required, monthly during the growing season.
 - .5 The Contractor shall be responsible for submitting monthly reports during the growing season identifying: maintenance work carried out, development and condition of plant material, and preventative or corrective measures which are outside of the Contractor's responsibilities.
 - .6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.
 - .7 Keep trunk protection and tree supports in proper repair and adjustment.
 - .8 Keep erosion control matting, wattles and silt fence effective and in good condition.
 - .9 Remove rodent/beaver control, silt fence and any watering devices at end of maintenance period.
 - .10 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

- .11 Re-Application:
 - .1 Re-apply seed to all areas that do not show a uniform stand of grass. A uniform stand of grass is growth with no bare spots greater than 0.25 m² in size and with a minimum of 80% ground cover. Re-application shall be carried out prior to final maintenance acceptance.

- .12 Contractor Responsibilities:
 - .1 Contractor to ensure that no plants are harmed or damaged during the maintenance activities. Physical precautions measures (e.g., flagged stakes along shrub perimeter area) may be used.

1.02 RELATED REQUIREMENTS

- .1 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.

- .2 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
 - .1 Section 31 32 19.16 - Soil Stabilization
 - .2 Section 32 91 19.13 - Topsoil and Subsoil Placement and Grading
 - .3 Section 32 92 19.13 - Seeding
 - .4 Section 32 93 10 - Plant Material
 - .5 Section 01 35 43 - Environmental Procedures

1.03 DEFINITIONS

- .1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.04 REFERENCE STANDARDS

- .1 Health Canada - Pest Management Regulatory Agency (PMRA)
 - .1 National Standard for Pesticide Education, Training and Certification in Canada (1995).

- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).

- .3 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
 - .2 Fertilizers Act (R.S. 1985, c. F-10).
 - .3 Fertilizers Regulations (C.R.C., c. 666).
 - .4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.05 REGULATORY REQUIREMENTS

- .1 Provide the Departmental Representative with copies of permits and licenses required by regulatory authorities, including applicator's current chemical license.

1.06 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 tree protection products, insect, fungal and disease products, all weed control chemicals.

1.07 MAINTENANCE / GUARANTEE

- .1 Maintain landscape works for a period of 3 years ending at the end of the third growing season from the date of completion of construction.

1.08 DAMAGE TO PROPERTY

- .1 The Contractor shall repair and pay for damages caused by Contractor's personnel and equipment during the term of the maintenance period.
- .2 Third Party damage is the responsibility of the Contractor prior to issuance of the Contract Completion, and in accordance with Section 01 77 00 - Close Out Procedures.
- .3 The Contractor shall report damages immediately to the Departmental Representative.
- .4 Obtain approval of the Departmental Representative for repairs and replacements. Return grass areas, plant materials, equipment and buildings to their original condition prior to damage. Scalping of turf and mechanical damage to trees including tearing of bark shall be considered as damage.
- .5 Complete repairs and replacements within seven days from date of approval given for repair or replacement.

1.09 NOTICE TO DEPARTMENTAL REPRESENTATIVE

- .1 The Contractor shall provide Departmental Representative with at least 5 business days advance notification of intent to access the site for maintenance activities, including intent to spray for weed and insect control.

1.10 MAINTENANCE LOG

- .1 Keep regular Maintenance Log throughout contract.
- .2 Submit Log to Departmental Representative at each site inspection meeting in accordance with Section 01 31 19 - Project Management and Coordination.
- .3 Include in Log: detail activities, areas in which activities were carried out, materials required, and approximate time for start-up and completion of each activity.
- .4 Detail applications of chemicals shall be included in Log:
 - .1 Include target weed or insect, mode, type, and rate of application of chemical, date, time, weather conditions and results of application.
 - .2 All herbicide applications must adhere to Alberta Regulations.
- .5 Test soil moisture and record notes in Log.

1.11 WEED MANAGEMENT PROGRAM

- .1 During each site visit during the three-year monitoring period Departmental Representative and Contractor shall inspect the site for regulated weeds, among other parameters. All regulated weeds encountered on the site will be controlled as directed by the Departmental Representative. Any non-regulated weed that is considered to be detrimental to Rocky Mountain House National Historic Site, as determined by the Departmental Representative, may also be actioned.
 - .1 Mowing: The use of mowing as a method to control weeds shall be recommended only under very specific conditions. Mowing can result in damage to the establishing vegetation, especially woody species and will therefore be only utilized to control specific plants and will not be used in any wide spread applications across the site. Mowing or clipping of all above ground growth will be used to eliminate seed dispersal and control annual weeds where ever directed by the Environmental Inspector.
 - .2 Herbicide Application: Ensure proper, positive identification of infestations and consult with Owner's Representative before taking corrective action.
 - .1 Prior to chemical applications, obtain written approval from Owner and post appropriate signs on site to notify the public in any locations where the public may come into contact with herbicides.
 - .2 Determine susceptibility of plant species to chemical damage prior to any chemical application.

- .3 Use equipment and containers free of harmful residues unrelated to specific control measures applicable to situation.
 - .4 Perform disease, weed and insect control, in accordance with Provincial chemical application regulation. Notify Owner and Owner's Representative of intent at least three (3) days prior to any chemical application.
 - .5 Prepare and apply chemical according to manufacturer's specification. Minimize drift at all times.
 - .6 Carry out treatment with due regard to climatic conditions' effect on surroundings and occupants of buildings.
- .2 The Contractor shall be required to prepare and submit a weed management program to the Departmental Representative 15 days following construction completion. Contractor to allow time for review by the Departmental Representative and for any required revision to the weed management program.

1.12 TOPSOIL TESTING

- .1 Contractor shall arrange and pay for services of accredited testing laboratory to perform complete soil quality analysis on topsoil(s).
- .2 Samples to be taken within six (6) months of proposed install. Provide adequate tests from all sources of topsoil.
- .3 Soil analysis shall include results for: petroleum hydrocarbons (BTEX, F1-F4), Tier 1 metals, existing soil nutrients; soil salinity expressed as electrical conductivity (EC) and sodium absorption ratio (SAR); pH value; organic matter; soil texture; fertility recommendations; recommended soil conditioning amendments; and weed seed analysis.
- .4 Submit original copy of analysis to the Departmental Representative for review and approval prior to use onsite. Test results shall include written summary of analysis from testing agency including: confirmation or denial of conformance to specification requirements; suitability of topsoil for proposed use and general quality of topsoil; recommendation for type and application rate of fertilizer, and any required amendments.

1.13 SUBSOIL TESTING

- .1 Contractor will arrange and pay for services of accredited testing laboratory to perform complete soil quality analysis on subsoil(s).
- .2 Samples to be taken within six (6) months of proposed install. Provide adequate tests from all sources of subsoil.

- .3 Soil analysis shall include results for: Petroleum hydrocarbons (BTEX, F1-F4), Tier 1 metals, soil salinity expressed as EC and SAR; pH value; and soil texture.
- .4 Submit original copy of analysis to the Departmental Representative for review and approval prior to use onsite. Test results shall include written summary of analysis from testing agency.

1.14 MAINTENANCE REQUIREMENTS

- .1 The Contractor shall guarantee that 80% of installed plants shall remain free from any defect or failure and withstand climatic, maintenance and normal operational conditions for the period of three (3) years from the date of the issuance of construction completion.
 - .1 Replacement of live plant material due to mortality exceeding 20% shall be completed at the cost of the Contractor during each year of maintenance.
- .2 The Departmental Representative shall perform inspections in the Spring and Fall of every year throughout the Maintenance period, except that the final inspection shall occur forty (40) months after the date construction is completed. Any plant material identified for replacement by the Departmental Representative during any inspection shall be replaced with new plant material within thirty (30) days unless otherwise directed by the Departmental Representative.
- .3 Replacement plant materials shall meet all the requirements of the initial planting.

2 PRODUCTS

2.01 MATERIALS

- .1 Topsoil: Imported topsoil: natural, fertile, friable, agricultural soil containing no less than 6% organic material with pH value ranging from 5.9 to 7.0 and acceptable EC and SAR as determined by the Departmental Representative.
- .2 Subsoil: Imported subsoil: natural, friable, medium textured soil containing few coarse fragments (<3%), with pH value ranging from 5.9 to 7.0 and acceptable EC and SAR as determined by the Departmental Representative.
- .3 Plant Protection Materials: Rodent protection, chemical repellent and/or tree wrap. If using chemicals, submit product data sheet to Departmental Representative.

- .4 Weed Control: Manual removal, mowing (weed whip) and/or chemicals as required by site conditions and in accordance with current regulations. If using chemicals, submit product data sheet to Departmental Representative.
- .5 Pest and Disease Control: Chemicals as required by site conditions and in accordance with current regulations. If using chemicals, submit data sheet to Departmental Representative.
- .6 Erosion control materials: matting, wattles and/or silt fence replacement as required.

3 EXECUTION

3.01 GENERAL WORKMANSHIP

- .1 Schedule timing of operations to growth, weather conditions and use of site. Provide copy of schedule for approval by Departmental Representative.
- .2 Do each operation continuously and complete within reasonable time period.
- .3 Provide equipment and material necessary for maintenance to acceptable horticultural standards.
- .4 Collect and dispose of excess material and debris daily.
- .5 Contractor shall submit updated log:
 - .1 Weekly during the Construction phase
 - .2 Monthly through the Maintenance phase.

3.02 TEMPORARY IRRIGATION

- .1 The Contractor shall provide water to all plants during the Maintenance Period.
- .2 Watering provided shall be conducted using a temporary irrigation system. The watering system shall deliver water to all seeded and planted areas.
 - .1 Contractor to obtain a Temporary Diversion Permit to draw water from the river. Any other watering methods may be used only once approved by the Departmental Representative. Contractor is responsible for water source. These include: water truck, ATV with water tank, or other methods as approved.
 - .2 The irrigation system may remain in place onsite throughout the maintenance period; however, shall be winterized by October 15 and re-initiated for spring by May 15.
 - .3 Watering required prior to installation of the temporary irrigation system shall be supplied by the Contractor.
 - .1 Water shall be free of impurities.
 - .2 Method of watering shall be discussed and approved by the Departmental Representative prior to initiating watering.

- .3 Apply water for a minimum of one hour (if water is applied in small volumes then water must be applied for longer until water has moved at least an inch deep into the soil profile).
 - .1 Watering shall be completed on a weekly basis during the first growing season within four (4) days of starting planting to the end of the growing season) unless otherwise directed. Watering during construction may be required if planting onsite occurs over greater than a four (4) day time span.
 - .2 After the first season watering will occur on a weekly basis during July and August and once every two weeks during May, June, September and October (to October 15).
 - .3 The Contractor shall assess the moistness of the soil has infiltrated at least 1 inch by manually measuring the depth of infiltration in three locations along the bank. At each location along the bank, the soil moisture shall be confirmed at the top of bank, mid bank, and lower bank slope positions to ensure the full project area is receiving sufficient watering.
 - .4 If during watering the Contractor notes the site is becoming excessively dry between watering events, the Department Representative shall be notified and the frequency of watering may be increased if appropriate.
- .4 The Contractor shall supply all labour, pumps, pipes, hoses, valves and related equipment to facilitate operation of the system. All temporary irrigation shall be removed at the end of the Maintenance Period.
- .5 The Contractor will remove the watering system prior to the final maintenance acceptance.

3.03 SPRING CLEAN-UP

- .1 Complete spring clean-up as soon as working conditions are favorable and no later than May 15.
- .2 Collect and dispose off-site any sand, gravel, garbage and debris, accumulated during winter months.
- .3 Remove unsightly, dead plant material at the request of the Departmental Representative.

3.04 EROSION CONTROL MAINTENANCE

- .1 Maintain and repair erosion control matting, wattles and silt fence as required to ensure they remain in place, continue to be effective and are not unsightly.
- .2 Replace damaged erosion control materials as required.

3.05 GRASS MAINTENANCE

- .1 Mowing (by weed whip):
 - .1 If noxious or regulated/undesirable weeds are present within the native grass areas mowing may be required by the Departmental Representative as part of the weed management strategy.
 - .2 Mow grass to height of 30 mm while using caution not to clip or cause damage to any shrubs, willows or trees either planted or naturally infilling.
 - .3 Do not remove grass clippings from areas unless volume is such as to be harmful to vegetation establishment or unsightly.
 - .4 Remove clippings from sidewalks, pathways, and roads during the same mowing.
 - .5 Variations in mowing operations during dry or wet weather shall be at the discretion of the Departmental Representative.
- .2 Topdressing and Re-Seeding:
 - .1 If bare areas or areas of poor growth are identified, topdressing or re-seeding may be required.
 - .2 Rake the area thoroughly, removing loose and dead grass, stones and debris.
 - .3 Spread topsoil (if directed) to maximum thickness of 10 mm, filling in low areas and bare spots.
 - .4 Overseed areas with seed mixture equivalent to existing grasses. Seed at rate that will be the same rate as the seeding rate specified in Section 32 92 19.13 - Seeding.
 - .5 Rake seed into topsoil. Roll lightly.
 - .6 Water to ensure penetration of 100 mm and at frequent intervals (at least weekly) to maintain vigorous growth.

3.06 TREE, SHRUB AND PERENNIAL MAINTENANCE

- .1 Maintenance of Plant Areas:
 - .1 Remove weeds monthly, including roots, when manual removal is specified by the Departmental Representative.
 - .2 Do not damage desirable plants.
 - .3 Collect and dispose of paper, refuse, and weed material offsite.
- .2 Watering:
 - .1 Test moisture levels of individual plant species and provide adequate water supply by hand if necessary, to augment irrigation system.
- .3 Weed, Insect, and Disease Control:
 - .1 General Considerations:
 - .1 Ensure proper, positive identification of infestations and consult with Departmental Representative before taking corrective action.
 - .2 Prior to chemical applications, obtain written approval from Departmental Representative.

- .3 Determine susceptibility of plant species to chemical damage prior to any chemical application.
 - .4 Use equipment and containers free of harmful residues unrelated to specific control measures applicable to situation.
 - .5 Perform disease, weed and insect control, in accordance with Provincial chemical application regulation. Notify Departmental Representative of intent at least three days prior to any chemical application.
 - .5 Prepare and apply chemical according to manufacturer's specification. Minimize drift at all times.
 - .6 Carry out treatment with due regard to climatic conditions' effect on surroundings and occupants of buildings.
- .4 Weed Control:
- .1 Control and/or remove weeds as directed by the Departmental Representative.
 - .2 If approved by Departmental Representative, apply chemical to eradicate weeds within boundary of site.
 - .3 Prepare and apply chemical according to manufacturer's specification. Minimize drift at all times.
 - .4 The Contractor shall repair and pay for damage caused by application of herbicides outside the Work area and in areas where weed control application has not been approved by the Departmental Representative.
 - .5 Effectiveness of treatment program to be determined by inspection by the Departmental Representative. Repeat as required.

3.07 BEAVER FENCING MAINTENANCE

- .1 Inspect the full length of fencing monthly and maintain and repair as required.
- .2 Repair/close any gaps at the base of the fence and ensure the fencing is upright.

3.08 INSECT AND DISEASE CONTROL

- .1 Inspect of plants for insect and disease infestations whenever Contractor is onsite. Apply chemicals based on development stage of insects' life cycles.
- .2 Repair and pay for damages caused by application of chemicals outside the Work area and in areas where application has not been approved by the Departmental Representative.
- .3 Effectiveness of treatment program to be determined by inspection by the Departmental Representative. Repeat as required.

3.09 AUTUMN PREPARATION

- .1 Deep water trees and shrubs between October 1 and 15, and again as required before winter freeze-up if directed by the Departmental Representative.
- .2 Protect plants from rodent damage.
- .3 Protect coniferous plants with burlap wrap during winter months, if warranted.
- .4 Protect tree trunks with tree wrap, if warranted.
- .5 Drain temporary irrigation system.

3.10 CLEANLINESS OF GROUNDS

- .1 Keep site area clean and tidy on a monthly basis.

4 MEASUREMENT AND PAYMENT

4.01 LANDSCAPE MAINTENANCE

- .1 Landscape Maintenance: Payment shall be by the unit price per year of landscape maintenance performed. This price shall include natural landscape maintenance activities, irrigation/watering, weed/disease control, erosion control material maintenance, beaver fence maintenance and all work and materials incidental thereto.
- .2 Payments will be released on an annual basis for each year of the three (3) year maintenance period following receipt, review and approval of the final maintenance report after each growing season.

END OF SECTION

1 GENERAL

1.01 SCOPE OF SECTION

- .1 This Section specifies the requirements for:
 - .1 Preservation and protection of existing trees and shrubs on site during the construction works.
 - .1 Coordinate existing tree and shrubs assessment with Departmental Representatives prior to any tree removals, installation of protection fencing, and any other construction.
 - .2 Supply and install fencing for protection around all existing trees and shrubs prior to construction.
 - .3 Maintain the existing trees and area inside the tree protection fencing during the contract period.

1.02 RELATED REQUIREMENTS

- .1 This Section specifies the protection of existing trees and shrubs during the contract period.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
 - .1 Section 31 32 19.16 - Soil Stabilization
 - .2 Section 32 01 90 - Landscape Maintenance
 - .3 Section 32 91 19.13 - Topsoil and Subsoil Placement and Grading
 - .4 Section 32 92 19.13 - Seeding
 - .5 Section 32 93 10 - Plant Material
- .4 The Contractor shall make best effort to adequately protect and maintain all existing trees within the 'Limit of Disturbance' and beyond the 'Limit of Disturbance'.
- .5 Trees within the protection fencing and on adjacent properties:
 - .1 Condition of existing trees in and adjacent to project work area will be reviewed and recorded by the Departmental Representative prior to protection fence installations.
 - .2 If the removal of viable trees is required as part of the construction work the replacement and/ or replacement value shall be calculated in accordance with Parks Canada policies.
 - .3 The condition of the trees within the protection fences will be monitored by the Departmental Representative for contract duration. The contractor will be responsible for all removals and replacement work (if required) and materials this entails if it is deemed the trees have not been adequately protected and cared for during the contract period.

- .4 Contractor is responsible for protecting any existing trees on adjacent properties and shall not be compensated for required replacements of damaged or destroyed trees outside the 'Limit of Disturbance'.

1.03 REFERENCE STANDARDS

- .1 Health Canada - Pest Management Regulatory Agency (PMRA)
 - .1 National Standard for Pesticide Education, Training and Certification in Canada (1995).
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .3 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
 - .2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- .4 Nomenclature: to "International Code of Nomenclature for Cultivated Plants".
- .5 Size and Development of Trees, Shrubs and Ground Covers: to "Metric Guide, Specifications for Specifications for Nursery Stock," current edition, by Landscape Canada.
- .6 Alberta Horticultural Guide: Alberta Agriculture Agdex 200/01.

1.04 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling:
 - .1 Obtain approval from Departmental Representative of schedule indicating beginning of Work.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for tree and shrub preservation materials (protection fencing and anti-desiccant) and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide monthly written reports during maintenance period, to Departmental Representative identifying:
 - .1 Maintenance work carried out.
 - .2 Development and condition of plant material.
 - .3 Preventative or corrective measures required which are outside Contractor's responsibility.
 - .3 Submit copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.

1.06 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect tree and shrub preservation materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
 - .4 Develop waste management plan related to Work of this Section in accordance to 01 35 43 - Environmental Procedures and Section 01 74 11 - Cleaning.

2 PRODUCTS

2.01 MATERIALS

- .1 Protection Fencing:
 - .1 General purpose - a temporary enclosure erected around a tree or shrub to be protected at the boundary of the protection zone serving four primary functions:
 - .1 To keep the foliage crown, branch structure and trunk clear from direct contact and damage by equipment, materials or disturbances.
 - .2 To preserve roots and soil in intact and non-compacted state.
 - .3 To identify the protection zone in which no soil disturbance is permitted and activities are restricted.
 - .4 To identify the tree root zones where regular watering must be conducted by the contractor to ensure the trees remain healthy throughout the contract period.
 - .2 Fence posts: shall be comparable to metal T-posts or heavier.
 - .3 Fencing material: shall be sturdy, durable and in a bright, contrasting colour.

3 EXECUTION

3.01 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for tree and shrub preservation installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.02 IDENTIFICATION AND PROTECTION

- .1 Tree/shrub protection to be installed prior to the start of any on site work.
- .2 Identify plants and limits of root systems to be preserved as approved by Departmental Representative.
- .3 Protect plant and root systems from damage, compaction and contamination resulting from construction as approved by Departmental Representative.
- .4 Ensure no root pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT).

3.03 TREE PROTECTION FENCE INSTALLATION

- .1 The protection fencing shall be installed as detailed on Contract Drawings ensuring that the tree drip line is inside the tree protection fencing. The fence shall be inspected and approved by Departmental Representative prior to construction start-up.

3.04 MAINTENANCE / ACCEPTANCE

- .1 General.
 - .1 Maintenance is required within 'Tree Protection Zones' for duration of contract.
- .2 Tree Protection Fence.
 - .1 Fencing and signage shall be maintained in an upright position and intact throughout the duration of the project.
- .3 Mowing and Weeding Requirements.
 - .1 Apply chemical to eradicate weeds within boundary of site. Repair and pay for damage caused by application of herbicides. Effectiveness of treatment program to be determined by inspection by Departmental Representative. Repeat as required.
 - .2 At the time of acceptance all trees inside the tree protection zones must be in a healthy, vigorous growing condition; under-story areas must be free of weeds, weed roots, rubbish and debris and be mowed as per the City's previously established standards.
 - .3 If herbicides cannot be used due to proximity of water or to shrubs or trees then hand weeding or use of a weed whip shall be used as directed by the Departmental Representative.

3.05 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 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.
- .3 Waste Management: all waste to be removed and disposed in accordance with Section 01 74 11 - Cleaning.
- .4 All damage to surrounding work must be repaired to the Departmental Representative's satisfaction.

4 MEASUREMENT AND PAYMENT

4.01 TREE PROTECTION

- .1 Payment shall be made by the unit price per linear meter of tree protection fencing and shall include all costs for supply and install of wire mesh complete with overlap, ties, staking, and all Work and Materials incidental thereto.

END OF SECTION

1 GENERAL

1.01 SCOPE OF SECTION

- .1 This Section specifies the requirements for:
 - .1 Topsoil and subsoil placement and fine grading in the rip-rap and embankment area.

1.02 RELATED REQUIREMENTS

- .1 This Section specifies the topsoil and subsoil during the contract period.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
 - .1 Section 31 32 19.16 - Soil Stabilization
 - .2 Section 32 01 90 - Landscape Maintenance
 - .3 Section 32 92 19.13 - Seeding
 - .4 Section 32 93 10 - Plant Material

1.03 REFERENCE STANDARDS

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
 - .1 PN1340-[2005], Guidelines for Compost Quality.
- .3 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.04 MATERIAL SUPPLIED BY DEPARTMENTAL REPRESENTATIVE

- .1 Departmental Representative will supply a portion of topsoil available for pickup within 500m from work zone.
- .2 The remaining volume of topsoil is to be sourced and provided by the contractor.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality control submittals:
 - .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described within this Section.
 - .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 - .3 Photographs: submit photographs of the proposed topsoil and subsoil source(s).

1.06 QUALITY ASSURANCE

- .1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and maintenance requirements.

1.07 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove and dispose of waste in accordance with Section 01 74 11 - Cleaning.
- .2 When required divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

1.08 TESTING

- .1 Contractor shall arrange and pay for services of accredited testing laboratory to perform complete soil quality analysis on topsoil(s) and subsoil(s).
- .2 Samples to be taken within six (6) months of proposed install. Provide adequate tests from all sources of topsoil and subsoil.
- .3 Soil analysis for topsoil(s) shall include results for: Petroleum hydrocarbons (BTEX, F1-F4), Tier 1 metals, existing soil nutrients; soil salinity expressed as electrical conductivity (EC) and sodium absorption ratio (SAR); pH value; organic matter; soil texture; fertility recommendations; recommended soil conditioning amendments; and weed seed analysis.

- .4 Soil analysis for subsoil(s) shall include results for: Petroleum hydrocarbons (BTEX, F1-F4), Tier 1 metals, soil salinity expressed as EC and SAR; pH value; soil texture and weed seed analysis.
- .5 Submit original copy of analysis (both the authorized pdf and excel tables from the laboratory) to the Departmental Representative. Test results shall include written summary of analysis from testing agency including confirmation or denial of conformance to specification requirements; suitability of topsoil for proposed use and general quality of topsoil; recommendation for type and application rate of fertilizer, and any required amendments.

2 PRODUCTS

2.01 TOPSOIL

- .1 On-site Topsoil (location shown within the Contract Drawings):
 - .1 Material to be screened by the Contractor; natural, fertile, friable, agricultural soil containing not less than 6% organic matter with pH value ranging from 5.9 to 7.0 and 'Good' quality ratings for EC and SAR.
 - .2 Texture shall be suitable for use onsite.
 - .3 Soil free from subsoil, slag, clay, stone, lumps, live plants, roots, sticks, quack grass, noxious and prohibited noxious weeds and foreign matter.
 - .4 Sample results shall be reviewed and approved by the Departmental Representative prior to transportation for use onsite.
- .2 Imported Topsoil:
 - .1 Screened natural, fertile, friable, agricultural soil containing not less than 6% organic matter with pH value ranging from 5.9 to 7.0 and 'Good' quality ratings for EC and SAR.
 - .2 Texture shall be medium-fine and suitable for use onsite as determined by the Departmental Representative.
 - .3 Soil free from subsoil admixing, slag, clay, stone, lumps, live plants, roots, sticks, quack grass, noxious weeds and foreign matter.
 - .4 Sample results shall be reviewed and approved by the Departmental Representative prior to transportation for use onsite.

2.02 SUBSOIL

- .1 Imported subsoil shall be:
 - .1 Natural, fertile, friable, agricultural soil with a pH value ranging between 5.9 to 7.0 and 'Good' quality ratings for EC and SAR. 'Fair' quality ratings for EC and SAR may be accepted at the "Sole discretion" of the Departmental Representative.

- .2 Texture shall be medium-fine and suitable for use onsite as determined by the Departmental Representative.
- .3 Soil free from slag, clay, stone, lumps, live plants, roots, sticks, quack grass, noxious weeds and foreign matter.
- .4 Sample results shall be reviewed and approved by the Departmental Representative prior to transportation for use onsite.

2.03 SOURCE QUALITY CONTROL

- .1 Advise Departmental Representative and provide photographs of sources of topsoil and subsoil to be utilized at least 96 hours prior to testing.
- .2 Contractor is responsible for amendments to supply topsoil as specified.
- .3 Soil testing shall be completed by recognized testing facility for outlined parameters.

3 EXECUTION

3.01 GENERAL REQUIREMENTS

- .1 The contractor shall not disturb any existing soil surface on site and will keep a barrier between the imported soil and soil surface on site until final placement to ensure no damage to the existing soil profile.
- .2 The site is extremely sensitive and no disturbance of existing soil surface is permitted for any reason.

3.02 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 properties and walkways, in accordance with Section 31 32 19.16 - Soil Stabilization.

3.03 GENERAL WORKMANSHIP

- .1 Contractor to review site conditions first hand prior to execution of work of this Section.
- .2 Prevent damage to fencing, landscaping, natural features, benchmarks, existing buildings, existing pavement, and utility lines which are to remain. Make good any damage.
- .3 Do not bury foreign material beneath areas to be landscaped.

3.04 PREPARATION

- .1 Locate runs of utility lines before commencement of work. Protect active lines from damage.
- .2 Install erosion and sediment control in accordance with Section 31 32 19.16 - Soil Stabilization.
- .3 Remove debris, roots, branches and other deleterious materials.
 - .1 Remove soil contaminated with calcium chloride, toxic materials, petroleum products and any other potential contaminant.
 - .2 Remove debris which protrudes more than 75 mm above surface.
 - .3 Dispose of removed material off site.
- .4 Complete Riprap Infill according to Section 31 00 99 - Riprap Infill.

3.05 PLACEMENT AND SPREADING OF SUBSOIL

- .1 Place subsoil from the top of bank, in dry weather.
- .2 Manually spread subsoil around obstacles as required.
- .3 Do not cover catch basins, valve covers or inspection pits.
- .4 Fine grade to ensure positive drainage.
- .5 Leave surface smooth, uniform and sufficiently firm to prevent subsidence when watered.
- .6 Achieve a uniform subsoil depth of 200mm.
- .7 Depth of subsoil shall be tapered at the toe slope to ensure subsoil and topsoil total depth is not more than 1/3 the height of the wattle. Refer to Contract Drawings
- .8 Depth of subsoil shall be tapers at the top of the embankment area to allow a smooth, natural looking transition to the top of bank area. Refer to Contract Drawings.

3.06 PLACEMENT AND SPREADING OF TOPSOIL

- .1 Place topsoil from the top of bank, in dry weather on dry, unfrozen grade.
- .2 Manually spread topsoil around obstacles as required.
- .3 Do not cover catch basins, valve covers or inspection pits.
- .4 Fine grade to ensure positive drainage.

- .5 Leave surface reasonably smooth, uniform and sufficiently firm to prevent subsidence when watered.
- .6 Achieve a uniform topsoil depth of 100mm.
- .7 Depth of topsoil shall be tapered at the toe slope to ensure subsoil and topsoil total depth is not more than 1/3 the height of the wattle. Refer to Contract Drawings.
- .8 Depth of topsoil shall be tapers at the top of the embankment area to allow a smooth, natural looking transition to the top of bank area. Refer to Contract Drawings.

3.07 ACCEPTANCE

- .1 Departmental Representative will inspect and test subsoil and topsoil in place and determine acceptance of material, depths and finish grading.

3.08 SURPLUS MATERIAL

- .1 Dispose of materials not required, except topsoil, off site.
- .2 Disposal location of surplus topsoil shall be determined by the Departmental Representative.

3.09 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

4 MEASUREMENT AND PAYMENT

4.01 TOPSOIL AND SUBSOIL PLACEMENT AND GRADING

- .1 Screened Topsoil from Onsite Stockpile to depth of 100 mm: Payment shall be by the cubic metre price for the specified depth, and shall include all costs for screening, processing, loading, hauling, dumping, preparation of subgrade, spreading, and fine grading of the topsoil; and all work and materials incidental thereto. Measurement shall be made of the cubic metre loose truck box measure.
- .2 Imported Screened Topsoil to depth of 100 mm: Payment shall be by the cubic metre price, and shall include all costs for supply, sampling, analysis, processing, loading, hauling, dumping, scarification of subgrade, spreading, and fine grading of the topsoil; and all work and materials incidental thereto. Measurement shall be made of the cubic metre loose truck box measure.

- .3 Imported Subsoil to depth of 200 mm: Payment shall be by the cubic metre price, and shall include all costs for supply, sampling, analysis, processing, loading, hauling, dumping, spreading, and fine grading of the subsoil; and all work and materials incidental thereto. Measurement shall be made of the cubic metre loose truck box measure.

END OF SECTION

1 GENERAL

1.01 SCOPE OF SECTION

- .1 This Section specifies the requirements for:
 - .1 Seeding - Broadcast seeding of native grass seed mix as indicated on contract drawings.

1.02 RELATED REQUIREMENTS

- .1 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .2 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
 - .1 Section 31 32 19.16 - Soil Stabilization
 - .2 Section 32 01 90 - Landscape Maintenance
 - .3 Section 32 91 19.13- Topsoil and Subsoil Placement and Grading
 - .4 Section 32 93 10 - Plant Material

1.03 REFERENCE STANDARDS

- .1 Complete seeding in accordance with the latest revision of the following standards except where specified otherwise.
 - .1 Government of Canada:
 - .1 Seeds Act and Seeds Regulations.

1.04 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and maintenance requirements in accordance with Section 01 31 19 - Project Management and Coordination.
- .2 Scheduling:
 - .1 Schedule seed installation to coincide with preparation of topsoil surface.
 - .2 Schedule seed installation when frost is not present in ground.

1.05 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 seed.
 - .2 Submit two (2) copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.

- .3 Samples:
 - .1 Provide the following submittals to the Departmental Representative:
 - .1 The following test results, certified by the seed supplier, at least 5 days prior to the delivery of seeds to the site:
 - .1 Germination rate, Tz, and inert material of each species of seed conducted within 24 months prior to the date of delivery to the site; and
 - .2 Weed Analysis; any prohibited or noxious weeds will result in rejection of the seed lot.
 - .2 Seed will be inspected to confirm proper quantity and quality.
- .4 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

1.06 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Landscape Contractor: to be a Member in Good Standing of Landscape Alberta Nursery Trades Association (LANTA).
 - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.
 - .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

1.07 DELIVERY, STORAGE AND HANDLING

- .1 Use all means necessary to protect material before, during, and after installation. Provide adequate protection to materials which may deteriorate if exposed to elements. Protect seed from moisture, mold, and damage while in transit.
- .2 Provide seed in standard containers clearly labelled with the following information:
 - .1 Supplier's name and address;
 - .2 Lot number;
 - .3 Net mass; and,
 - .4 Names and percentages of individual seed species.
- .3 In event of damage or rejection, make immediate repairs and replacements at no extra cost to the Department Representative.

- .4 Delivery and Storage Requirements:
 - .1 Protect seed from moisture, mold, and damage while in storage.
 - .2 Grass seed: Deliver and store in original packages; label indicating:
 - .1 Analysis of seed mixture.
 - .2 Percentage of pure seed by weight.
 - .3 Year of production.
 - .4 Net mass.
 - .5 Date tagged and location.
- .5 Packaging Waste Management: remove and dispose of all packaging and waste in accordance with Section 01 74 11 - Cleaning.

1.08 MAINTENANCE

- .1 For seeding, 36 months maintenance period is extended to 40 months.
- .2 Contractor hereby warrants that seeding will remain free of defects until the end of the maintenance period.
- .3 End-of-maintenance inspection will be conducted by Departmental Representative.

2 PRODUCTS

2.01 MATERIALS

- .1 Provide materials in accordance with the following:
 - .1 Seed mixture:
 - .1 Provide Canada No. 1 Grade seeds that comply with the Government of Canada Seeds Act and Seeds Regulations where possible. If not possible the product must be approved by the Departmental Representative (Native Seed).
 - .2 Seed certificates for each species, including weed analysis and germination analysis, shall be provided for review and approval by the Departmental Representative.
 - .2 Provide seeds and seed mixtures that are free of all provincial noxious and prohibited noxious weed seeds as per the Alberta Weed Act.

2.02 GRASS SEED MIX AND SEEDING RATE

.1 Grass Seed Mix: Native species, readily available commercially

Species Code	Scientific Name	Common Name	% of Seed Mix (Pure Live Seed)	Kg required
Elymcan	<i>Elymus canadensis</i>	Canada Wildrye	17%	2.49
Agrotra	<i>Agropyron trachycaulum var</i>	Slender Wheatgrass	10%	1.43
Bromcar	<i>Bromus carinatus</i>	Mountain Brome	12%	1.78
Agrodas	<i>Agropyron dasystachyum</i>	Northern Wheatgrass	24%	3.42
Agrosmi	<i>Agropyron smithii</i>	Western Wheatgrass	33%	4.69
Boutgra	<i>Bouteloua gracilis</i>	Blue Grama	1%	0.13
Koelmac	<i>Koeleria macrantha</i>	Junegrass	3%	0.43
Total			100%	14.38

.2 Seeding Rate:

Seeding Method	Broadcast
Invasion Threat	Extreme
Moisture Regime	Mesic
Nutrient Regime	Rich
Erosion Risk	Extreme
Habitat Type	Deciduous Forest
Natural Subregion	Central Parkland
Seeding Rate (seeds/m ²)	495.60
Seeding Rate (kg/ha)	47.92

2.03 WATER

- .1 Free of impurities that would inhibit germination and growth.
- .2 Contractor to provide a temporary irrigation system and shall obtain a temporary diversion permit for river water in accordance with Section 32 01 90 - Landscape Maintenance.

3 EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLERS

- .1 Work performed under this Section will be done under the supervision of a foreman skilled in the work of this Section and with Certified Horticultural Technician, Journeyman Landscape Gardener, or Professional Agrologist certification. The Contractor may be required to submit the qualification of assigned personnel.
- .2 Contact Departmental Representative to attend initial seed mixing process.

3.03 SEED BED PREPARATION

- .1 Do not perform work under adverse field conditions as determined by Departmental Representative.
- .2 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site as per regulatory requirements and in accordance with Section 01 74 11 - Cleaning.
- .3 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and commence work when instructed by Departmental Representative.
- .4 Fine grade surface free of humps and hollows to smooth and even grade to tolerance of plus or minus 15 mm, surface draining naturally.
- .5 Cultivate fine graded surface approved by Departmental Representative to 25 mm depth immediately prior to seeding.

3.04 BROADCAST SEEDING

- .1 Sow seed during calm weather when soil moisture content is adequate for germination. Seed can be applied before or after erosion control matting is installed.
- .2 Provide prepared surfaces that are free of frost and standing water.

- .3 Cover seed by raking or chain harrowing to ensure seed contact with soil.
- .4 Water entire area with fine spray immediately after each area has been sown.
- .5 Apply water in sufficient quantities to prevent grass and underlying soil from drying out. Do not cause displacement of seeds when watering.
- .6 Re-seed areas which show root growth failure, deterioration, bare or thin spots, or which have been damaged by any means, including replacement operations.
- .7 Minimize foot and equipment traffic on seeded areas.
- .8 Use watering equipment and techniques approved by the Departmental Representative.

3.05 RE-APPLICATION

- .1 Re-apply seed to all areas that do not show a uniform stand of grass. A uniform stand of grass is growth with no bare spots greater than 0.25 m² in size and with a minimum of 80% ground cover.

3.06 CLEANING

- .1 Progress and final cleaning and waste management shall be completed in accordance with Section 01 74 11 - Cleaning.

3.07 PROTECTION

- .1 Immediately after seeding, erect barricades, temporary fences, and warning signs to protect seeded areas from traffic until grass is established.

3.08 FINAL ACCEPTANCE

- .1 Seeded areas shall be accepted by Departmental Representative provided that:
 - .1 Areas are uniformly established free of rutted, eroded, bare or dead spots and extent of weeds apparent in grass is acceptable.
- .2 Areas seeded in fall shall be inspected for acceptance the following spring, one month after start of growing season provided acceptance conditions are fulfilled.
- .3 Final inspection and acceptance shall occur at the end of the Maintenance period as per Section 01 77 00 - Closeout Procedures.

4 MEASUREMENT AND PAYMENT

4.01 SEEDING

- .1 Payment for seeding shall be made at the unit price per square metre for Grass Seed Mix as shown on the Contract Drawings. This price will include all costs for sourcing and supplying the material, seed bed preparation, sampling, testing, spreading, watering, guarantee, and all Work and Materials incidental thereto. Measurement for seed shall be made of the kilogram (kg).

END OF SECTION

1 GENERAL

1.01 SCOPE OF SECTION

- .1 This Section specifies the requirements for:
 - .1 Tree planting
 - .2 Shrub planting
 - .3 Live stake installations
 - .4 Rodent/Beaver fence installation

1.02 RELATED REQUIREMENTS

- .1 This Section specifies the planting required during the contract period.
- .2 The General Conditions of Contract and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.
- .3 Cooperate and coordinate with the requirements of other units of work specified in other Divisions.
 - .1 Section 31 32 19.16 - Soil Stabilization
 - .2 Section 32 01 90 - Landscape Maintenance
 - .3 Section 32 91 19.13 - Topsoil and Subsoil Placement and Grading
 - .4 Section 32 92 19.13 - Seeding

1.03 REFERENCE STANDARDS

- .1 Agriculture and Agri-Food Canada (AAFC).
 - .1 Plant Hardiness Zones in Canada-[2000].
- .2 Canadian Nursery Landscape Association (CNLA)
 - .1 Canadian Standards for Nursery Stock-[2006].
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
- .5 Nomenclature: to "International Code of Nomenclature for Cultivated Plants".
- .6 Size and Development of Trees, Shrubs and Ground Covers: to "Metric Guide, Specifications for Specifications for Nursery Stock," current edition, by Landscape Canada.
- .7 Alberta Horticultural Guide: Alberta Agriculture Agdex 200/01.

1.04 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling: obtain approval from Departmental Representative of schedule seven (7) days in advance of shipment of plant material.
- .2 Schedule to include:
 - .1 Quantity and type of plant material.
 - .2 Shipping dates.
 - .3 Arrival dates on site.
 - .4 Planting Dates.
- .3 The Department Representative shall supply the live stakes (to be delivered by the supplier in two (2) shipments); however, the Contractor is responsible for coordinating delivery schedule and receipt onsite.

1.05 MATERIAL SUPPLIED BY DEPARTMENTAL REPRESENTATIVE

- .1 Departmental Representative will supply live stakes for the Work.
- .2 The Contractor is responsible for coordinating deliveries by the supplier, temporary onsite storage of live stakes, installation and all incidental labour, materials and actions. If additional deliveries are required, it shall be at the Contractor's expense. All deliveries shall take place prior to June 15, 2019.

1.06 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 trees, shrubs, anchoring equipment, fencing and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.
- .3 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with Section 01 35 43 - Environmental Procedures.

1.07 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Landscape Contractor: to be a Member in Good Standing of Landscape Alberta Nursery Trades Association (LANTA).
 - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.
 - .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.
- .2 Plant material shall be inspected by the Departmental Representative prior to installation onsite to confirm the condition and health of plants.

1.08 DELIVERY, STORAGE AND HANDLING

- .1 Delivery of live stakes shall be completed by the supplier. Contractor is responsible for coordinating delivery(ies), storage and handling of the live stakes following delivery. Minimize time required for storage onsite of live stakes.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Protect plant material from frost, excessive heat, wind and sun during delivery.
 - .2 Protect plant material from damage during transportation:
 - .1 Delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
 - .2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
 - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .3 Storage and Handling Requirements for Potted Plants:
 - .1 Immediately store and protect plant material which will not be installed within one (1) hour in accordance with supplier's written recommendations and after arrival at site in storage location approved by Departmental Representative.
 - .2 Protect stored plant material from frost, wind and sun and as follows:
 - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.
 - .2 For pots and containers, maintain moisture level in containers. Heel-in fibre pots.
- .4 Storage and Handling Requirements for live cuttings:
 - .1 Dormant cuttings are to remain in cold storage (<-2 degrees C) at the suppliers' greenhouse until one (1) week prior to planting. Contractor to coordinate
 - .2 At the suppliers' greenhouse, once removed from cold storage, live stakes shall be soaked in oxygenated water (containers) with 80% of the stake below water and 20% of the stake above water. Stakes installed between October 1st and June 1st shall be soaked in water for 7 days and after June 1st, between 3-4 days.
 - .3 Live stakes shall be delivered in two separate deliveries as coordinated by the Contractor based on construction progress.
 - .4 Live stakes shall be inspected by the Departmental Representative upon delivery, prior to planting, to confirm condition and health of the stakes.

- .5 Any live stakes which will not be planted immediately following delivery shall be stored in water (containers, not the river) with a minimum of 80% of the stake below water and up to 20% of the top of the stake above water. Removal of stakes from the water shall occur immediately before planting. On site storage in water may not be more than 3 days. Shipments from the supplier will be coordinated to ensure delivery of the appropriate number of stakes in each shipment.
 - .6 Live stakes shall not be allowed to dry out between removal from water and installation.
 - .7 If root buds begin to show up on stakes, they must be immediately planted.
 - .8 If stakes are to be installed in July-September they will be rooted in April and installed as rooted cuttings with roots at least 30cm up the base of the stem and leaves established.
 - .9 Store and manage hazardous materials in accordance with manufacturer's written instructions.
- .4 Do not install plants whose soil balls have been cracked or broken prior to or during planting or when burlap ropes required in connection with their transplanting have been removed.
 - .5 Dead or diseased plants or live stakes shall not be planted. Replace damaged or rejected plants at no cost to Departmental Representative.

1.09 MAINTENANCE PERIOD

- .1 For plant material as itemized on plant list, the maintenance period is 36 months.
- .2 Contractor hereby warrants that plant material as itemized on plant list will remain free of defects until the end of the maintenance period..
- .3 End-of-maintenance inspection will be conducted by Departmental Representative.
- .4 Departmental Representative reserves the right to extend Contractor's maintenance responsibilities for an additional one year if, at end of initial maintenance period, survival, leaf development and/or growth is not sufficient to ensure future survival.

1.10 SUBSTITUTIONS

- .1 No substitutions of specified plant material permitted, unless approved by the Departmental representative.

1.11 STAGES OF APPROVAL

- .1 Notify Departmental Representative and obtain approvals at following stages of project:
 - .1 Site delivery: have trees, shrubs and live stakes inspected on site prior to installation.

- .2 Tree planting: installation of first tree to be approved prior to installing remaining trees.
- .3 Shrub planting: layout of shrubs to be approved prior to installation.
- .4 Live Stake Installation: A Departmental Representative will be present for all live stake installations.

2 PRODUCTS

2.01 PLANT MATERIAL

- .1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
 - .1 Source of plant material:
 - 1. Plant material will be sourced (seed sourced from within south or central Alberta (Edmonton South)).
 - 2. Plant material will be grown in Zone 1, 2, or 3a or 3b in accordance with Plant Hardiness Zones in Canada. Plant material grown in other Hardiness Zones can be used if approved by the Departmental Representative and the plant material has been acclimatized at least 2 weeks prior to planting in zone 1, 2 or 3.
- .2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- .3 Trees: with straight trunks, well and characteristically branched for species.
- .4 Shrubs: natural form, typical of genus, species and variety, minimum of 5 canes.
- .5 All live plant materials must be sourced with within southern Alberta (Edmonton South), preference will be given to materials that are sourced (seed or cuttings) from within 200km of the project site (or approved by the Departmental Representative), to ensure hardiness of the plants. For growers outside this zone their materials may be used if the seed source genetics of their material comes from within southern Alberta. All plants coming from out of province must be acclimatized for at least two (2) weeks within Alberta prior to planting to ensure they will successfully establish during the early spring planting that will occur within this project.
- .6 Sources of materials must be submitted to the Departmental Representative prior to purchase to confirm that the material meets the requirements for the project. It is preferred that source material to propagate all plants comes from as close to Rocky Mountain House as possible. Any modifications to the species used must be approved by the Departmental Representative.
- .7 For all planting activity that occurs prior to April 30th all plants must be installed dormant or just sprouting new growth. For plants installed after April 30th they must be appropriately acclimatized

with a minimum of two (2) weeks growing outside in or near Rocky Mountain House.

- .8 Contractor shall provide packing plant tags or slips to the Departmental Representative that reference plant species and source. All tags shall be removed from plants prior to planting.

2.02 PLANT SIZES

- .1 Potted Plants:
 - .1 Refer to Drawings and associated notes/legends for specified sizes of potted materials.
 - .2 Larger plants may be substituted but smaller plants will not be accepted.
- .2 Live Stakes:
 - .1 Shall be provided by the Departmental Representative.
 - .2 Refer to Drawings and associated notes/legends for specified sizes of live stakes and bundles.

2.03 WATER

- .1 The Contractor shall provide water to all plants during the Maintenance Period. Watering shall occur in accordance with Section 32 01 90 - Landscape Maintenance.

2.04 BEAVER CONTROL

- .1 Fencing Materials:
 - .1 Wire: 25mm (1") square galvanized stucco wire mesh - 12 to 16 gauge - 1200mm wide roll
 - .2 Ties: 4" zip ties
 - .3 Stakes: 38x38x2100 Heavy-duty green steel fence T-post or approved equal

2.05 SOURCE QUALITY CONTROL

- .1 Obtain approval from Departmental Representative of plant material prior to planting.
- .2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

3 EXECUTION

3.01 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for planting installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.02 PRE-PLANTING PREPARATION

- .1 Proceed only after receipt of written acceptability of plant material from Departmental Representative.
- .2 Remove damaged roots and branches from plant material.
- .3 Apply anti-desiccant to deciduous trees in leaf in accordance with manufacturer's instructions.
- .4 Locate and protect utility lines.
- .5 Implement temporary erosion and sedimentation controls as required within the Erosion and Sedimentation Controls Plan submitted in accordance with Section 01 35 43 - Environmental Procedures.

3.03 PREPARATION

- .1 For individual planting holes for potted plants:
 - .1 Stake out location and obtain approval from Departmental Representative prior to excavating.
 - .2 Excavate to depth and width as indicated.
 - .3 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.
 - .4 Scarify sides of planting hole.
 - .5 Remove water which enters excavations prior to planting. Notify Departmental Representative if water source is ground water.
- .2 For live stakes:
 - .1 Identify wooden survey stakes used to mark planting locations and to create pilot holes for live stakes within the riprap and installed during riprap infilling (Section 31 00 99 - Riprap Infill).
 - .2 Stake out locations along the brush layer and obtain approval from the Departmental Representative prior to planting.

3.04 POTTED PLANT INSTALLATION

- .1 All potted material will be planted as directed by the Contract Drawings at the appropriate density and within the appropriate planting zone along the bank.

- .2 For container stock in non-degradable wrapping, remove entire container or wrapping without damaging root ball. Wrapping shall be collected throughout planting and disposed of.
- .3 Plant vertically in locations as indicated.
 - .1 Placed plants at same depth they were originally grown.
- .4 For trees and shrubs:
 - .1 Backfill soil in 150 mm lifts.
 - .1 Tamp each lift to eliminate air pockets.
 - .2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.
 - .3 After water has penetrated into soil, backfill to finish grade.
 - .2 Form watering saucer as indicated.
- .5 Water plant material thoroughly.
- .6 After soil settlement has occurred, fill with soil to finish grade.

3.05 LIVE STAKE INSTALLATION

- .1 Live stake planting to be completed as noted on Contract Drawings, refer to Landscape Notes and Schedules.
- .2 When removed from the water the stakes will be installed immediately to ensure they do not dry out.
- .4 Prepare live stake installation pilot holes by:
 - .1 Removing survey stakes, if installed within the riprap during infilling (within riprap) or,
 - .2 Using a drilling or non-compacting method (within the Embankment Area). Do not compact in-hole soils.
- .5 Install cutting so basal end (angled cut) is placed into the hole first. That is, the basal end of the cutting is downward, consistent with its natural orientation.
- .6 Install cutting so that a minimum of 80% of the cutting is buried below the surface and that the soil surrounding the hole is not compacted. Ensure there are no large air pockets around the buried cutting portion. If possible, have a minimum of two buds exposed and three buds buried.
- .7 Ensure a bucket-mixed soil-water slurry is placed around cutting (in the hole) if drilled pilot hole is larger than cutting diameter. Air pockets around the cutting will damage or kill roots and reduce soil moisture.

3.06 RODENT/BEAVER CONTROL

- .1 Following planting, the beaver control fence shall be installed.
- .2 Fence shall be placed below and immediately adjacent to the silt fence as per the Contract Drawings.
- .3 Roll out wire along the length of the sides and base of the planted area so the area is surrounded on three sides.
- .4 Use 38x38x2100 Heavy-duty green steel fence T-post or approved equivalent to secure the wire in an upright to slightly slanted position. Slant shall be toward the river.
 - .1 Posts shall be anchored into the riprap. Posts shall be located at least every four (4) meters; however, spacing may vary based on appropriate anchoring locations within the riprap.
 - .2 Wire shall be secured to the post using 4" zip ties or approved equivalent.
 - .3 The base of the wire shall be anchored into the wattle and silt fence so as to "seal" the bottom of the fence and prevent beavers, or other herbivores, from entering the planted area.

3.07 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 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.

3.08 CLOSEOUT ACTIVITIES

- .1 Submit maintenance reports for trees, shrubs, stakes and fencing in accordance with Section 01 77 00 - Closeout Procedures and Section 01 78 00 - Closeout Submittals.

4 MEASUREMENT AND PAYMENT

4.01 PLANT MATERIAL

- .1 Trees: Payment shall be made by the unit price per plant, and shall include all costs for the supply and installation of shrubs, guarantee, and all Work and Materials incidental thereto.
- .2 Shrubs: Payment shall be made by the unit price per plant, and shall include all costs for the supply and installation of shrubs, guarantee, and all Work and Materials incidental thereto.

- .3 Live Stakes: Payment shall be made by the unit price per stake and shall include all costs for the storage and installation of stakes, guarantee, and all Work and Materials incidental thereto. The live stakes shall be supplied by the Departmental Representative.

- .4 Beaver Control Fencing: Payment shall be made by the unit price per linear meter of wire mesh and will include all costs for supply and install of wire mesh complete with overlap, ties, staking, and all Work and Materials incidental thereto.

END OF SECTION