

**Parks Canada Agency**

**Specifications for**

**Project No.: F11-696**

**Ya Ha Tinda Ranch Road Rehabilitation**

**Hillside and Highland Roadworks**

**Banff National Park, Alberta**

**Prepared for  
Parks Canada Agency**

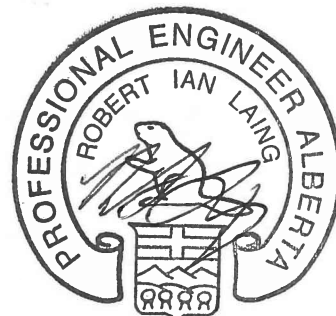
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The Association of Professional Engineers and Geoscientists of Alberta	



*JUN 19 - 2017*

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**1. GENERAL**

**1.1 PRECEDENCE**

- .1 Division 1 Sections take precedence over technical specification sections in other Divisions of this specification.

**1.2 DESCRIPTION OF WORK**

- .1 Work of this Contract comprises the site drainage and roadway upgrades, including, but not limited to, the following:
  - .1 Mobilization and demobilization of all personnel, equipment, support facilities and materials, and acquiring all necessary permits and licenses required to complete the Work.
  - .2 Stripping from within new road alignment for placement on finished slopes.
  - .3 Removal of existing trees.
  - .4 Locate existing utilities through Hydrovac and protect from damage existing utilities and existing entrance access and roadways.
  - .5 Excavating and disposing of unsuitable materials.
  - .6 Excavating and grading all classes of materials for new realigned roadway.
  - .7 Supply, load, haul, place and compact all classes of materials for construction of new realigned roadway.
  - .8 Supply, load, haul, place and compact all classes of materials for repair of existing gravel roadways.
  - .9 Supply and installation of culverts, guardrail and signage
  - .10 Construction of erosion protection.
  - .11 Disposal of all unusable materials, such as excess stripped topsoil and all stockpiled materials offsite or onsite pending client approval.
  - .12 Topsoil placement and seeding at designated areas.
  - .13 Traffic accommodation during all construction activities.
  - .14 General site rehabilitation and clean-up
  - .15 All construction, measurement for payment, and as-built surveys are to be completed by Contractor. The Departmental Representative will perform QA checks as necessary. This work is incidental with no separate payment being made. Provide as-built drawings to Department Representative at completion of the work.

**1.3 SUBMITTALS**

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

**1.4 WORK SCHEDULE**

- .1 Provide and maintain Work Schedule in accordance with instructions of Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.

**1.5 WORK BY OTHERS**

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

**1.6 EXISTING SERVICES**

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout the course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.
- .3 Provide alternative routes for pedestrian and vehicular traffic if required to maintain safe passage through the workzone at all times.
- .4 Conduct all operations such that the integrity of the nearby pasture fencing is maintained and protected from damage at all times.
- .5 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .6 Submit schedule to and obtain approval from Departmental Representative for any shutdown or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .7 Provide adequate bridging over trenches which cross roads to permit normal traffic.
- .8 Record locations of maintained, rerouted and abandoned service lines.

**1.7 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each of the following:
  - .1 Contract drawings.
  - .2 Specifications.
  - .3 Requests for Clarification and responses.

- .4 Addenda.
- .5 Change Orders.
- .6 Reviewed shop drawings.
- .7 Other modifications to Contract.
- .8 Field test reports.
- .9 Copy of approved Work Schedule.
- .10 Manufacturers' installation and application instructions.
- .11 Material and Safety Data Sheets Specifications.
- .12 Environmental Protection Plan (EPP)
- .13 Other documents as specified.

**2. PRODUCTS**

**2.1 NOT USED**

- .1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 ACCESS AND EGRESS**

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, in accordance with relevant regulations.

**1.2 USE OF THE SITE AND FACILITIES**

- .1 The Work Site (limits shown on Drawings) will be specified by Parks Canada and shall only be used for the purposes of the Work. The Work Site will be made available by Parks Canada to the Contractor for its non-exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.
- .2 Contractor shall maintain adequate drainage at the Work Site.
- .3 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of source. Snow shall be removed by the Contractor as necessary and at his cost for the performance and inspection of the Work.
- .4 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep area and premises in sanitary condition.
- .5 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at its expense.
- .6 No hauling of material during inclement weather.
- .7 The Contractor will not be permitted to adversely impact wildlife or vegetation during critical life stages (breeding, nesting, rearing, and migration) unless prior written approval is granted by the Departmental Representative. The Contractor shall consult with the Departmental Representative and the Parks ESO regarding any localized wildlife concerns.
- .8 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .9 Construction to be carried out during daylight hours only.

**1.3 SPECIAL REQUIREMENTS**

- .1 Ensure that Contractor personnel employed on site become familiar with and obey regulations including environmental, safety, fire and traffic regulations.
- .2 Archeological sites exist in the proposed realignment Highland section of this project. The contractor shall coordinate his activities accordingly to allow time for 3<sup>rd</sup> party mitigation which is currently underway.
- .3 Work is to take place in the proximity of known archeological sites of interest. Extreme care is to be exercised in these areas and if any archeological significant items are exposed

during construction, work shall stop and the departmental representative immediately notified.

- .4 Contractor to provide a minimum 1 week advance notice of any ground disturbance to allow the Departmental Representative to have personnel on site to monitor excavations.

#### **1.4 WORK CONDUCTED OVER AND ADJACENT TO WATERWAYS**

- .1 All components of the Work shall be conducted in accordance with Section 01 35 43 – Environmental Procedures, the “Ya Ha Tinda Road Repair Basic Impact Analysis”, and the Environmental Protection Plan prepared for the project.
- .2 All components of the Work shall be conducted without equipment entering into wetlands, water bodies, or streams.
- .3 All waste materials from the Work shall be contained and collected in a manner to prevent any contact with the river valleys and waterways. All collected waste materials shall be protected, covered and disposed of in accordance with Section 01 35 43 – Environmental Procedures and the Environmental Protection Plan prepared for the project.
- .4 The Contractor is responsible for the development and supply of construction access to the Work as approved by the Departmental Representative.

#### **1.5 SURVEY OF EXISTING PROPERTY CONDITIONS**

- .1 Submission of tender is deemed to be confirmation that the Contractor has inspected the site and is conversant with all conditions affecting execution and completion of work.
- .2 The Contractor shall regularly monitor the condition of the Work Site and of property on and adjoining the Work Site throughout the construction period, and shall immediately notify the Owner if any deterioration in condition is detected. Such monitoring shall cover all pertinent features and property including, but not limited to, buildings, structures, roads, walls, fences, slopes, sewers, culverts and landscaped areas.
- .3 The Departmental Representative may, but shall not be obligated to, survey and record the condition of the Work Site and of property on or adjoining the Work Site prior to the commencement of construction by the Contractor. If requested, the Departmental Representative will provide a copy of the survey records to the Contractor for reference.
- .4 Whenever supplied with survey records, the Contractor shall satisfy itself as to the accuracy and completeness of the survey records provided by the Departmental Representative for any area before commencing construction in that area.
- .5 Commencement of construction in any area shall be interpreted to signify that the Contractor has accepted such survey records as being a true record of the existing conditions prior to construction.
- .6 The provision of the records of a survey of existing conditions by the Departmental Representative shall in no way limit or restrict the Contractor's responsibility to exercise proper care to prevent damage to all property within or adjacent to the Work Site, whether all such property is covered by the survey or not.



**2. PRODUCTS**

**2.1 NOT USED**

.1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

.1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 PRIME COST SUM**

- .1 Included in Contract Price a total Prime Cost Sum of **\$110,000**.
- .2 Do not include in the Contract Price, additional contingency allowances for products, installation, overhead or profit.
- .3 Prime Cost Sum provided for in the Lump Sum Arrangement Table is not a sum due to the Contractor. Rather, payment will be made against it for miscellaneous work not included in the unit price table under the General Conditions of the Contract.
- .4 Such work may include, but not be limited to:
  - .1 Additional clearing, grubbing, trimming, stripping, materials, hydroseeding or landscaping, ditching, and shoulder gravelling,
  - .2 Additional excavation, loading, hauling, crushing, stockpiling, and placing of aggregate materials or riprap;
  - .3 Additional earthwork, slope / roadway stabilization including the use of geotextiles.
  - .4 Additional relocation or removal and disposal of existing signs, guide posts and other miscellaneous items;
  - .5 Additional removal, disposal, plugging or debris removal of existing culverts;
  - .6 Additional supply and installation of culverts;
  - .7 Additional supply and installation of permanent signs (not construction signs);
  - .8 Supply and installation of raised reflective road markers and barrier reflectors;
  - .9 Supply of wooden and steel posts;
  - .10 Additional survey resulting from changes made by the Departmental Representative;
  - .11 Additional road structure repairs;
  - .12 Providing Additional Traffic Control equipment.
  - .13 Additional remediation or removal and replacement of unsuitable or contaminated soils not described in the contract documents;
  - .14 Additional supply and installation of guide posts;
  - .15 Sub-drainage not specified in the tender documents;
  - .16 Minor brushing and tree removal on ROW;

- .17 Additional ditching and drainage improvements;
- .18 Providing facilities for Owner (Office or Lab Trailer)
- .19 Miscellaneous work as directed by the Departmental Representative.
- .5 The Contract Price, and not Prime Cost Sum, includes Contractor's overhead and profit in connection with the Work.

## **1.2 MEASUREMENT AND PAYMENT**

- .1 Payment for Work under the "Prime Cost Sum" will be made using negotiated rates or by material, labour and equipment rates as per the following:
  - .1 Rental rates will be in accordance with current Alberta Roadbuilders and Heavy Construction Association rate schedule, and will be all inclusive and fully operated.
  - .2 Hourly rental of equipment will be measured in actual working time and necessary travel time within project limits.
  - .3 Transportation time to and from site will be reimbursed only for equipment used exclusively for additional work.
- .2 When based upon actual costs for additional works under Prime Cost Sum, payment will be based upon supplied invoices and other work records.
- .3 The Prime Contractor may apply a 10% mark-up to subcontractor or supplier invoices only, as approved by the Departmental Representative. No mark-up will be allowed on relevant equipment and labour rates.
- .4 A claim for additional payment will not be considered submitted until all required documentation has been received, reviewed and approved by Departmental Representative.

## **2. PRODUCTS**

- .1 Products shall be in accordance with the most recent edition of the Alberta Transportation Standard Specifications for Highway Construction and the current Alberta Transportation Approved Products List, or as directed by the Departmental Representative.

## **3. EXECUTION**

- .1 Work shall be in accordance with most recent edition of the Alberta Transportation Standard Specifications for Highway Construction, or as directed by the Departmental Representative.

**END OF SECTION**

**1.        GENERAL**

**1.1      DEFINITIONS**

- .1    Mobilization is the necessary work and operation including, but not limited to complying with requirements of the Agreement, the movement of personnel, major equipment, supplies and incidentals to the work, the establishment of offices, camps, and other facilities necessary to undertake the work and for expenses incurred for other work and operations which must be performed prior to the commencement of the work.

**1.2      MEASUREMENT AND PAYMENT**

- .1    Payment for mobilization at the Lump Sum price bid for "Mobilization and Demobilization" will be full compensation for all costs associated with mobilization and demobilization. 50% of Lump Sum Contract Price for Mobilization and Demobilization to be paid when mobilization to site is complete. The remainder of the Lump Sum Price for Mobilization and Demobilization to be paid at substantial completion.
- .2    The amount for mobilization will be paid only once regardless of the number of times the Contractor mobilizes.
- .3    There will be no separate payment made for demobilization.

**2.        PRODUCTS**

**2.1      NOT USED**

- .1    Not used.

**3.        EXECUTION**

**3.1      NOT USED**

- .1    Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 APPLICATIONS FOR PROGRESS PAYMENT**

- .1 This is a Unit Price Contract. Quantities given in the tender are considered approximate. Final payment to the Contractor will be made only for the actual quantities of Work performed or Material furnished in accordance with the Plans and Specifications as confirmed by the Departmental Representative. It is agreed that the quantities of Work to be done or Material to be furnished may be altered by the Departmental Representative.
- .2 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Departmental Representative may reasonably be required to establish value and delivery of products.

**2. PRODUCTS**

**2.1 NOT USED**

- .1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 ADMINISTRATIVE**

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.
- .2 Departmental Representative to prepare agenda for meetings.
- .3 Departmental Representative will give written notice of each meeting five (5) days in advance of meeting date to Contractor.
- .4 Provide physical space and make arrangements for meetings.
- .5 Departmental Representative will preside at meetings.
- .6 Departmental Representative will record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three (3) days after meetings and transmit to meeting participants and affected parties not in attendance.
- .8 Representative of Contractor, Sub-Contractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

**1.2 PRECONSTRUCTION MEETING**

- .1 Within five (5) days after award of Contract, request a meeting of parties in contact to discuss and resolve administrative procedures and responsibilities.
- .2 Departmental Representative, Contractor, Sub-Contractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum of five (5) days before meeting.
- .4 Agenda to include:
  - .1 Appointment of official representative of participants in the Work.
  - .2 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
  - .3 Proposed hours of work per day and number of days per week
  - .4 Schedule of submission of shop drawings and samples. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .5 Requirements for temporary facilities site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 – Construction Facilities.

- .6 Proposed changes, change orders, procedures, approvals required, markup percentages permitted, time extensions, overtime, administrative requirements.
- .7 Record drawings in accordance with Section 01 33 00 – Submittal Procedures.
- .8 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 – Closeout Submittals.
- .9 Monthly progress claims, administrative procedures, photographs, hold backs.
- .10 Appointment of inspection and testing agencies and firms.
- .11 Permitting and Environmental Requirements
- .12 Insurance and transcript of policies
- .13 Other business as required by the Departmental Representative or Contractor.

### **1.3 PROGRESS MEETINGS**

- .1 During course of Work and two (2) weeks to project completion, schedule progress meetings every 2 weeks.
- .2 Contractor, Sub-Contractors involved in Work and Departmental Representative are to be in attendance.
- .3 Notify parties prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within days of meeting.
- .5 Agenda may include:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedule.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for effect on construction schedule and on completion date.

.12 Other business.

**2. PRODUCTS**

**2.1 NOT USED**

.1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

.1 Not used.

**END OF SECTION**



**1. GENERAL**

**1.1 REQUIREMENTS**

- .1 Plan to complete Work in accordance with prescribed milestones and timeframe.
- .2 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence to this contract.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

**1.2 SUBMITTALS**

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

**1.3 PROJECT SCHEDULE**

- .1 Project milestone dates as follows:
  - .1 Highland Road construction start-up August 1, 2017
  - .2 Hillside Road construction start-up September 5, 2017
  - .3 Substantial Completion December 1, 2017
- .2 Develop detailed Project Schedule
- .3 Ensure detailed Overall Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award of Contract
  - .2 Start-up meeting
  - .3 Contractor supplied equipment and materials
  - .4 Permits
  - .5 Mobilization
  - .6 Material delivery
  - .7 Topsoil/Sod Stripping
  - .8 Backfilling and re-grading
  - .9 Placement of granular materials

- .10 Roadway rehabilitation
- .11 Fence Installation
- .12 Topsoil/Sod and Seeding
- .13 Utility Adjustments and Culvert Installation
- .14 Guardrail and Signage Installation
- .15 Demobilization
- .16 Project completion and Final Certificate of Completion.

#### **1.4 PROJECT SCHEDULE REPORTING**

- .1 Submit formal revised Project Schedule on bi-weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

#### **1.5 PROJECT MEETINGS**

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

#### **2. PRODUCTS**

##### **2.1 NOT USED**

- .1 Not used.

#### **3. EXECUTION**

##### **3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 ADMINISTRATIVE**

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

**1.2 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross reference to design drawings and specifications.
- .3 Allow five (5) days for Departmental Representative's review of each submission.

- .4 Adjustments made on shop 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.
- .5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .6 Accompany submissions with transmittal letter, in duplicate, 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.
- .7 Submissions shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erections details.
    - .4 Capacities.
    - .5 Performance characteristics.
    - .6 Standards.

- .7 Operating weight.
- .8 After Departmental Representative's review, distribute copies.
- .9 Submit one transparency and an electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .10 Supplement standard information to provide details applicable to project.
- .11 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .12 The review of shop drawings by Department Representative is for sole purpose of ascertaining conformance with general concept.
  - .1 This review does not mean that the Department Representative approves detail design inherent in shop drawings, responsibility for which remains with Contractor submitting same, and such review does not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation for co-ordination of Work of sub-trades.

## **2. PRODUCTS**

### **2.1 NOT USED**

- .1 Not used.

## **3. EXECUTION**

### **3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

## **1. GENERAL**

### **1.1 CONSTRUCTION SAFETY MEASURES**

- .1 Observe and enforce construction safety measures required by National Building Code 1990 Part 8 Provincial Government, Canada Labour Code, Part 2, Canada Occupational Safety and Health Requirements, Alberta Occupational Health and Safety Regulations, Workers' Compensation Board and municipal statutes and authorities.
- .2 The contractor shall immediately bring any conflict between any provisions of the above authorities to the attention of the Department Representative, who shall give direction on which provisions shall apply.
- .3 The contractor shall ensure that appropriate measures are taken to protect workers from the hazards created by traffic including the provision and wearing of safety vests at all times.
- .4 If the work site has an existing emergency plan, the contractor shall familiarize all workers on site of the contents of this plan.
- .5 The contractor shall adhere to any key control systems established by the client to protect the work site.
- .6 The contractor shall develop procedures for dealing with any site specific electrical hazards and make them available to the Department Representative upon request. The contractor shall ensure that these procedures include hazard assessment and control measures and that all workers on-site are familiar with and prescribed procedures followed.
- .7 The contractor shall take appropriate measures while working along the existing road alignment above Scalp Creek to ensure worker safety and maintain integrity of existing slope. Use of heavy construction equipment should be minimized to prevent likelihood of slope failure.

### **1.2 SUBMISSIONS**

- .1 Prior to commencement of construction, submit a site-specific Health and Safety Plan to the Department Representative 72 hours prior to the commencement of Work. The Departmental Representative may provide comment to the contractor regarding the Codes of Practice but this comment will not in any way reduce or limit the contractors responsibility for the safety of workers and/or the general public affected by the work. The site-specific Health and Safety Plan must include:
  - .1 Contractor's safety policy.
  - .2 Identification of applicable compliance obligations.
  - .3 Definition of responsibilities for project safety / organization chart for project including designated 24 hour emergency contact information .
  - .4 General safety rules for project.

- .5 Job specific safe work procedures.
- .6 Inspection policy and procedures.
- .7 Incident reporting and investigation policy and procedures.
- .8 Occupational Health and Safety meetings.
- .9 Occupational Health and Safety communications and record keeping procedures.
- .10 Results of site specific safety hazard assessment.
- .11 Results of safety and health risk or hazard analysis for site tasks and operation.
- .2 The Contractor shall submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.
- .3 The Contractor shall submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .4 The Contractor shall submit copies of incident and accident reports.
- .5 The Contractor shall submit copies of Material Safety Data Sheets (MSDS) to Departmental Representative.
- .6 The Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within ten (10) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within five (5) days after receipt of comments from Departmental Representative.
- .7 The Departmental Representative's review of Contractor's final Health and Safety plan does not relieve the Contractor of Occupational Health and Safety Prime Contractor responsibilities.
- .8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .9 The Contractor shall address standard operating procedures to be implemented during emergency situations through an on-site Contingency and Emergency Response Plan.

### **1.3 RESPONSIBILITIES FOR WORKSITES WITH MORE THAN ONE EMPLOYER**

On all worksites where there is more than one employer, the designated Prime Contractor is responsible for:

- .1 Ensuring that information is available on all contacts for safety matters as outlined in 1.2.3 above.

- .2 Ensuring that all information provided by the Department Representative on safety matters is communicated to all other work site contractors.
- .3 Establish and maintain a system or process that will ensure compliance with the Occupational Health and Safety Act and Regulations in respect of the work site, including:
  - .1 Documentation of the system or process for health and safety management that will be used at the work site.
  - .2 Documentation of the site wide hazard assessment, critical tasks hazard assessment and codes of practice established for the work site.
  - .3 Forwarding a copy of this documentation to the Occupational Health and Safety Services section of the Department responsible for the contract.

#### **1.4 INSPECTION AND REPORTING**

- .1 The contractor shall conduct frequent inspections to ensure compliance with legislation. Any unsafe conditions or work practices observed shall be corrected as soon as possible. In the event of an imminent danger situation, Section 27 of the Occupational Health and Safety Act shall be followed. All reports provided by outside agencies shall be copied to the Department Representative within 24 hours following the inspection.
- .2 All serious or potentially serious accidents or incidents shall be reported as required by the Occupational Health and Safety Act. In addition the Department Representative shall be notified immediately and provided with a copy of the investigation report as soon as practicable.

#### **1.5 PRE-CONSTRUCTION SAFETY MEETING**

- .1 Prior to the commencement of work on the site, a meeting will be held with all the personnel likely to be involved during the construction phase including consultants, designers, project managers, the Departmental Representative, contractors site and head office personnel, and subcontractors.
- .2 The meeting will discuss all aspects of site safety with specific reference to the way in which the prime contractor intends to discharge their responsibilities.
- .3 The Departmental Representative may raise particular aspects of the Occupational Health and Safety Act or related issues considered to be of special importance to the contract.

#### **2. PRODUCTS**

- .1 Not used.

#### **3. EXECUTION**

- .1 Not used.



**Parks Canada Agency**  
**Project No.: F11-696**  
**Ya Ha Tinda Ranch Road Rehabilitation**  
**Hillside and Highland Roadworks**  
**Banff National Park, Alberta**

**OCCUPATIONAL HEALTH &  
SAFETY REQUIREMENTS**

**Section 01 35 29.06**  
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**END OF SECTION**

**1. GENERAL**

**1.1 MEASUREMENT AND PAYMENT**

- .1 Cost of Traffic Control described in this Section 01 35 31 – Special Procedures for Traffic Control, shall be considered incidental to the Contract, and no additional payment will be made.
- .2 Cost of keeping existing roadway clean, free of pot holes and available for public use while Contractor is on site shall be considered incidental to the Contract, and no additional payment will be made.
- .3 Cost of snow removal for Contractor to do the work identified in the Contract while Contractor is on site shall be considered incidental to the Contract, and no additional payment will be made.

**1.2 REFERENCES**

- .1 The Contractor shall provide traffic control in accordance with current edition of:
  - .1 AT-Traffic Accommodation in Work Zones (latest edition)
  - .2 AT-Traffic Control Standards (latest version)
  - .3 Manual of Uniform Traffic Control Devices for Canada, (MUTCD) distributed by Transportation Association of Canada.

**1.3 GENERAL**

- .1 In order to minimize risks to public traffic, the Contractor shall develop and implement a Traffic Management Plan (TMP) in accordance with AT-Traffic Accommodation in Work Zones (latest edition), AT-Traffic Control Standards (latest version) and TAC Manual of Uniform Traffic Control Devices for Canada (MUTCD), except where specified otherwise. The TMP will include plans specific to each detour and access point required for this project. This plan shall be updated regularly in response to any incidents or changes in conditions, be they weather, work, traffic, or otherwise.
- .2 The Contractor shall design, supply, erect, move and maintain all traffic control devices, signs, other safety measures and provide staff to ensure safe passage of all traffic from commencement of site work to date of acceptance by the Departmental Representative.
- .3 All traffic and warning signs shall be either bilingual or of a symbolic or pictorial type. If bilingual signs are used, the English and French message shall be of equal letter size and at the same elevation, with English on left and French on right. Assistance in translation of construction and warning signs to French may be obtained from Parks Canada.
- .4 Contractor shall have appropriate traffic control measures in place so that roadway traffic is maintained through the work zone at all times throughout the construction.

- .5 The Contractor shall coordinate traffic management procedures with other Contractors working in the area.
- .6 Where guardrail systems are temporarily removed, temporary glow posts shall be installed at 20 m intervals on straight sections and at 10 m intervals on curves and shall remain in place until permanent guardrail systems has been installed. Payment for removal, installation, and temporary glow posts shall be considered incidental to the Contract, and no additional payment will be made.

#### **1.4 PROTECTION OF PUBLIC TRAFFIC**

- .1 The Contractor shall comply 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.
- .2 A minimum of one travelling lane 4 m wide shall be maintained by the Contractor at all times to provide for safe movement of traveling public through the work area. The Contractor shall submit a TMP to the Departmental Representative for review and acceptance prior to commencement of work. Short closures may be allowed by the Departmental Representative for some activities as long as the delay to motorists does not exceed 20 minutes.
- .3 Emergency vehicles (i.e., ambulance, RCMP, Park Warden) must be granted immediate passage at all times.
- .4 The Contractor shall provide competent, certified and properly equipped flag persons.
- .5 The Contractor shall also provide competent supervision and/or contract personnel as required during non-working hours to ensure that safety flares, flashing beacons, signs, lights, etc. are in proper working order.
- .6 The Departmental Representative will monitor the traffic control measures, and may require modifications of these measures from time to time to achieve satisfactory traffic flow, safety of traveling public and coordination with adjacent contracts.
- .7 The Contractor shall minimize dust in the construction zone by means of cleaning and watering when required.
- .8 Keep travelled way clean, free of pot holes.
- .9 At detours (if required) and at access points, Contractor shall:
  - .1 Have appropriate signage, and other safety features necessary.
  - .2 Keep areas clean and free of pot holes, failures, and rutting.
  - .3 Provide competent supervision and/or contract personnel as required during non-working hours to ensure that safety flares, flashing beacons, signs, lights, etc., are in proper working order.

## **1.5 INFORMATIONAL AND WARNING DEVICES**

- .1 The Contractor shall provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work that requires road user response.
- .2 The Contractor shall supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in the TMP submitted by the Contractor and approved by the Departmental Representative.
- .3 Signs shall be wind resistant.
- .4 As situation on site changes, Contractor to update his Traffic Management Plan outlining signs and other devices required for the project and submit for the approval of the Departmental Representative.
- .5 The Contractor shall continually inspect and maintain traffic control devices in use by:
  - .1 Checking signs daily for legibility, damage, suitability and location.
  - .2 Cleaning, repairing or replacing signs as required ensuring clarity and reflectance.
  - .3 Removing or covering signs that do not apply to conditions existing from day to day or time to time.

## **1.6 CONTROL OF PUBLIC TRAFFIC**

- .1 The Contractor shall provide competent flag persons, trained in accordance with, and properly dressed and equipped as specified in, AT - Traffic Accommodation In Work Zones (latest edition) :
  - .1 When public traffic is required to pass working vehicles or equipment, that block all or part of travelled roadway.
  - .2 When vehicles are entering or exiting Work Site access points.
  - .3 When vehicles are entering or exiting gravel pits in the park.
  - .4 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.
  - .5 When workmen 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.
  - .6 Where temporary protection is required while other traffic control devices are being erected or taken down.
  - .7 For emergency protection when other traffic control devices are not readily available.

- .8 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

## **1.7 OPERATIONAL REQUIREMENTS**

- .1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified herein and approved by Departmental Representative to protect and control public traffic.
- .2 Maintain existing conditions for traffic crossing right-of-way.
- .3 No stoppage of traffic shall be allowed during inclement weather conditions.

## **2. PRODUCTS**

- .1 Not used.

## **3. EXECUTION**

- .1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 RELATED SECTIONS**

- .1 All Specifications.

**1.2 MEASUREMENT PROCEDURES**

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

**1.3 GENERAL**

- .1 A Basic Impact Analysis (BIA) has been prepared for this project entitled "Parks Canada Basic Impact Analysis, Ya Ha Tinda Road Repair". This document is incorporated by reference and the Environmental Protection Plan (EPP), to be prepared by the contractor shall describe in detail how the included mitigation measures will be implemented during the project activities.
- .2 All Contractor operations shall be performed in such a manner that no detritus from his operations shall enter any river, waterway, ditch, or wetland.
- .3 If, in the opinion of the Departmental Representative or Parks Canada, full containment of Contractor's detritus is not being achieved, operations may be ordered halted until the situation is rectified.

**1.4 NATIONAL PARK REGULATIONS**

- .1 The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
- .2 The Contractor and any sub-Contractors shall obtain a business license from the Parks Canada Administration Office in Banff prior to commencement of the contract.
- .3 All Contractor's business and private vehicles are required to obtain a vehicle work pass from Parks Canada. These permits may be obtained free of charge from the Environmental Surveillance Officer (ESO) or as directed by the departmental representative.

**1.5 CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)**

- .1 Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA 2012) and subsequent amendments.
- .2 The Contractor is required to prepare an Environmental Protection Plan (EPP), which will address all mitigations outlined in the Basic Impact Analysis and include the topics in the following sub sections.
- .3 Failure to comply with or observe environmental protection measures as identified in these specifications may result in the Work being suspended pending rectification of the problems.

- .4 The Contractor shall notify the ESO and the Departmental Representative in a reasonably timely manner of any actual or potential environmental incidents or failure of protection measures, and immediately of any violations of environmental approvals, permits, authorizations or EPP measures.

## **1.6 ALBERTA ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT (AEPEA)**

- .1 The contractor and subcontractors shall meet all aspects of the AEPEA. Contractors will be responsible for reporting all of their own, and their subcontractors releases or spills in or about the work site in accordance with the Act. Reporting shall be to the Director of Pollution Control, Alberta Environment. The Departmental Representative shall be copied on all AEPEA reports.

## **1.7 RELICS AND ANTIQUITIES**

- .1 There may be cultural resources present in the project area that have not yet been discovered (even after an archaeological assessment has been carried out or no assessment was deemed necessary for the project). If staff observe any significant cultural resources while working, they should stop work in the area, and immediately contact the Departmental Representative, or a Parks Canada archaeologist or cultural resource advisor, to discuss any protective measures that might be needed. Wait until written instructions from the Departmental Representative say it is clear to proceed with work.
- .2 Significant resources that could be considered grounds for work stoppage include, but are not limited to, human remains, unique or diagnostic artifacts, and/or artifacts directly associated with known sites and/or unidentified sites in the area, cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found on the site, and such items shall remain the property of Parks Canada. Protect such articles and request directives from Parks Canada.
- .3 Provide 48 hours' notice to Parks Canada prior to commencing any work that may interfere with or affect any identified historical or archaeological site. Parks Canada archaeologists will be on site during soil stripping of any previously undisturbed land and they shall be permitted access to the site and work area to closely supervise the work. Commence work only upon written instruction from Parks Canada.

## **1.8 WILDLIFE**

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

## **1.9 DRAINAGE**

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control dispersal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .4 The Contractor's EPP will detail how the dewatering will be undertaken, with special attention to the environmental sensitivity of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond reclamation.

## **1.10 FIRE PREVENTION AND CONTROL**

- .1 The predominant landscape feature is grassland which is a significant fire risk.
- .2 A fire extinguisher will be carried and available for use on each machine in the event of fire (e.g. ignited by a spark) to prevent the fire from burning the unit or spreading to other fuels in the work area. Basic firefighting equipment – e.g. three shovels, two pulaskis, and two 20 litre backpack pumps shall be maintained at the construction site at a location known and easily accessible to all the Contractor's staff. Contractor's staff shall receive basic training in early response to wildfire events during the "environmental briefing".
- .3 Machinery and equipment shall be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.
- .4 Care shall be taken while smoking on the construction site to ensure that accidental ignition of any flammable material is prevented. Fires or burning of waste materials are not permitted.
- .5 The Contractor shall maintain an awareness of the fire danger rating (Index) in the work area by contacting the Banff Fire Duty Officer (FDO) (April through October) or Fire/Vegetation Specialist for Banff National Park (November through March). Fire prevention care is to be commensurate with the fire Index.
- .6 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The FDO, Fire/Vegetation Specialist, ESO and the Departmental Representative shall be notified of any fire immediately.
- .7 Deliberately lighting of fires or burning of waste materials is strictly not permitted.

## **1.11 SITE ACCESS AND PARKING**

- .1 A plan detailing access to the construction site shall be prepared by the Contractor and included in the EPP. This includes access and facilities within the work limits, including day-to-day entry/egress and plans for delivery and approach for large dimension materials will be anticipated and described. Any proposed use of a helicopter shall be detailed. The access plan shall describe worker transportation to and from the construction site, and parking of



workers' private vehicles. Specific details of any vehicles to transport workers to site or site equipment to be used on the trails are to be provided.

- .2 Restrict vehicle movements to work limits.
- .3 Do not park vehicles in areas beyond work limits, unless specifically authorized by the ESO and the Departmental Representative. Generally, personal vehicles shall be parked at least 10 metres distance from any watercourse.

#### **1.12 EROSION CONTROL**

- .1 The Contractor shall prepare an Erosion and Sediment Control (ESC) Plan to the satisfaction of the Departmental Representative and the ESO.
- .2 Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the construction site are a critical element of the project and shall be implemented by the Contractor.
- .3 The ESC plan must detail site isolation plans for culvert repair and installation locations where surface flows are present. Site isolation plans must be prepared by a Qualified Aquatic Environmental Specialist (QAES).
- .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, remediated, or replaced. The Departmental Representative and ESO will also monitor erosion control performance.
- .5 The site will be secured against erosion during any periods of construction inactivity or shutdown.

#### **1.13 POLLUTION CONTROL**

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment to local authorities' emission requirements.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary access.

#### **1.14 CONTRACTOR'S OPERATIONS**

- .1 Confine all operations to the work limits as staked or designated by the Departmental Representative. No activities of any kind may be carried out beyond those work limits without the written permission of the Departmental Representative.
- .2 Do not store or stockpile construction materials unnecessarily and do not unreasonably encumber the site with products.
- .3 Provide sufficient sanitary facilities and maintain such facilities in a clean condition.
- .4 Conduct operations at all times in such a manner as to preserve the natural features and vegetation in the area. Cut and fill slopes shall be blended with adjoining topography.

Material from fill slopes shall not be permitted to slough or roll into surrounding areas or to bury any plant material designated to be retained.

- .5 When in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the staked or designated work area, the Contractor shall be responsible, at his expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of Parks Canada.
- .6 Failure to comply with or observe environmental protection requirements as identified in these specifications may result in work being suspended pending rectification of the problems and operators of equipment being charged under the National Park Act.

#### **1.15 WORK ADJACENT TO WATERWAYS**

- .1 Do not operate equipment in waterways.
- .2 Do not use materials from waterway beds as a source of borrow material.
- .3 Do not dump soil, gravel, waste or debris in waterways.
- .4 Do not haul logs or construction materials in or through waterways.
- .5 Fuelling operations and fuel storage shall be at least 200 m away from watercourses.
- .6 Sediment control measures shall comply with the ESC plan and be to the satisfaction of the ESO.
- .7 Fuel management requirements are explained in the Equipment Fuelling, and Spill Containment sub section.

#### **1.16 START-UP AND ENVIRONMENTAL BRIEFING**

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

#### **1.17    HAZARDOUS PRODUCTS AND MATERIALS**

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

#### **1.18    SPILL CONTAINMENT PLAN**

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

#### **1.19    EQUIPMENT FUELLING AND MAINTENANCE**

- .1 Equipment used on the project shall be fueled with E10 gasoline and low sulphur diesel fuels.
- .2 A fuel delivery, storage and distribution plan shall be submitted. Topics to be addressed in the EPP will include, but not necessarily be limited to:
  - .1 Diesel and gasoline supply vehicles, including bulk tankers shall be parked more than 100 meters from waterbodies.
  - .2 Fuel tanks with manual or electric pump delivery systems shall be used, gravity feed is not allowed.
  - .3 Fuelling personnel shall maintain immediate attention to and presence at the fuelling operation.
  - .4 Fuelling sites will be identified by the Departmental Representative and the ESO.
  - .5 Lubricant changes and minor repairs shall be conducted at a location identified by the Departmental Representative in consultation with the ESO. Waste lubricants, used filters and other waste maintenance products shall be removed from the Ya Ha Tinda Ranch to recycling or certified disposal sites.

- .6 Equipment shall be inspected daily for fluid/fuel leaks and maintained in good working order.
- .7 Equipment to be used on the project site shall be thoroughly cleaned of soil, seeds and any debris or external contaminants outside the Ya Ha Tinda Ranch before delivery to the work site.

## **1.20 OPERATION OF EQUIPMENT**

- .1 Equipment and vehicle (including personal) movements shall be restricted to the 'footprint' of the construction area. The work limits shall be identified by stake and ribbon or other methods approved by the Departmental Representative. Unless authorized by the Departmental Representative, activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities. If some of the construction requires working close to watercourses or water bodies the Contractor is to describe measures to be employed to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) do not enter any watercourses, to the satisfaction of the Departmental Representative and ESO.
- .2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the trees bordering the right-of-way or into watercourses or water bodies.
- .3 When, in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc., to the satisfaction of the Departmental Representative and ESO.
- .4 The Contractor shall restrict vehicle movements to work limits.
- .5 Workers private vehicles are to remain within the construction footprint, or as directed by the Departmental Representative.

## **1.21 WASTE MATERIAL STORAGE AND REMOVAL**

- .1 The Contractor shall prepare a Construction and Waste management plan as a part of the EPP. The Plan shall include the following basic principle:
  - .1 Waste reduction which follows the 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
  - .2 Wastes generated at the construction site are to be contained and removed in a timely and approved manner. The EPP shall detail the waste management procedures, including the following:
    - .1 Describe the management of waste.
    - .2 Construction wastes shall be stored in containers at an approved location and removed promptly when the containers are 90% full.

- .3 A concerted effort to reduce, reuse and recycle materials is expected.
  - .4 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
  - .5 Provide containers to deposit recyclable materials.
  - .6 Transport all recyclable materials to an approved recycling facility off site.
  - .7 Waste materials are to be disposed at a certified construction waste landfill off of Ya Ha Tinda Ranch property and outside the National Parks. No burying, burning or discarding of waste materials will be permitted at the construction site, Ya Ha Tinda Ranch property or elsewhere in National Parks.
  - .8 No materials attractive to wildlife are to be stored at the site overnight – daily removal is mandatory. Human food products are to be contained in a manner so as not to attract animals and waste food stuffs are to be removed from the construction site every day.
  - .9 Portable container toilets are to be provided in sufficient numbers and locations to ensure convenient usage including frequency of pump out.
- 
- .3 All garbage must be stored and handled in conformance with the National Parks' Garbage Regulations.
  - .4 Dispose of all hazardous wastes in conformance with the Environmental Contaminates Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
  - .5 Provide bear proof garbage containers on-site for domestic garbage generated on-site by Contractor's personnel and make arrangement for collection and disposal on a daily basis or when directed by the Departmental Representative.
  - .6 Maintain the site in a tidy condition, free from the accumulation of waste products, debris and litter.
  - .7 Do not dispose of or allow dispersing waste or volatile materials such as mineral spirits, oil or paint thinners or other hazardous wastes into waterways. Provide clean-up equipment and adequate supply of absorbent material on-site.

## **1.22 VEGETATION REMOVAL AND PROTECTION OF THE WORK LIMITS**

- .1 The EPP shall detail how the work limits will be marked and what procedures will be employed to ensure trespass outside these limits does not occur. Any vegetation willfully or negligently removed shall be replaced in size and kind two fold.

## **1.23 SENSITIVE AND NO-GO ZONES**

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

**2.      PRODUCTS**

- .1    Not Used.

**3.      EXECUTION**

**3.1    STORAGE AND CONTAINMENT OF EXCAVATED MATERIAL**

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

**END OF SECTION**

**1. GENERAL**

**1.1 MEASUREMENT AND PAYMENT PROCEDURES**

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

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA)
- .2 CAN/CSA-A23.2-04, Methods of Test and Standard Practices for Concrete
- .3 AT - Standard Specifications for Highway Construction (latest edition)

**1.3 QUALITY CONTROL PLAN**

- .1 Contractor's quality control plan shall be in accordance with AT – Standard Specifications for Highway Construction (latest edition)
- .2 Submittals in accordance with 01 33 00 – Submittal Procedures

**1.4 TESTING BY THE CONTRACTOR**

- .1 The Contractor shall perform all Quality Control testing required to assure that the Work strictly complies with the Contract requirements. This shall include, but not be limited to:
  - .1 All testing specified in the Contract Documents;
  - .2 Any other testing required as a condition for deviation from the specified Contract procedures;
- .2 Testing shall be in accordance with AT – Standard Specifications for Highway Construction (latest edition) in collaboration with the current ASTM and CSA Standards or as stated below.
- .3 The Contractor shall be fully responsible and bear all costs for all quality control testing and shall conduct such testing in the following manner:
  - .1 Provide testing facilities and personnel for the tests and inform the Departmental Representative in advance to enable the Departmental Representative to witness the tests if so desired;
  - .2 Notify the Departmental Representative when sampling will be conducted;
  - .3 Within one Day after completion of testing, submit test results to the Departmental Representative; and
  - .4 Identify test reports with the name and address of the organization performing all tests, and the date of the tests.

- .4 Approval of tested samples will be for characteristics or use named in such approval and shall not change or modify any Contract requirements.
- .5 Testing agencies, their inspectors, and their representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the Contract Documents, nor to approve or accept any part of the Work.
- .6 The minimum frequency for Quality Control testing during embankment construction will be as follows:

<b>CONSTRUCTION TYPE</b>	<b>TEST TYPE</b>	<b>MINIMUM FREQUENCY* OF TESTS</b>
Embankment construction with fine grained or granular soil	Standard Proctor by: ASTM D698	1 per change in material or 1 per week, whichever is more frequent
	Field density by: ASTM D1556 - Sand Cone ASTM D2167 - Balloon ASTM D2922 - Nuclear	1 per 1000m <sup>2</sup> per lift, spaced randomly across full width of embankment
	Proof Roll and or Rutting Test	As required by the Departmental Representative
Road structure construction with granular materials	Standard Proctor by: ASTM D698	1 for each material type and 1 for each accepted change in material gradation
	Field density by: ASTM D1556 - Sand Cone ASTM D2167 - Balloon ASTM D2922 - Nuclear	3 tests per 50 m per lift; on centreline and on left and right fog lines
	Proof Roll and or Rutting Test	As required by the Departmental Representative
Culvert Installation	Field density	Minimum 3 per 300 mm lift per culvert, spaced through the length and depth of the culvert backfill
Tests During Aggregate Production	C 136 Dry Sieve Analysis of Aggregate  Or  C117 Sieve analysis of Aggregates by washing (Modified for Field Lab with drying done over a hotplate or similar heating element)	-Split Stockpiles: 1 for each stockpile for every 2 hours of production. -One main stockpile: for every 300 tonnes. -Blend Sand: 1 for every 100 tonnes during stockpiling. -Natural Filler: 1 for every 50 tonnes during stockpiling
	D 5821 Determining the percentage of Fractured Particles in Coarse	Every second coarse aggregate sieve test



	Aggregate	
	C 117 Sieve Analysis of Aggregates by Washing (Modified for Field Lab)	1/shift on reduced sample obtained from combined samples from the crusher

## **1.5 CONTRACTOR'S QUALITY CONTROL PROGRAM**

- .1 The Contractor shall prepare a Quality Control Program. The purpose of the program shall be to ensure the performance of the Work in accordance with Contract requirements.
- .2 The Quality Control Program shall be described in a Quality Control Manual. The Contractor shall submit the Manual to the Departmental Representative for review in accordance with Section 01 33 00 – Submittal Procedures. The Manual shall develop a logical system for tracking and documenting the Quality Control of the Work. A systematic format and a set of procedures patterned on a recognized Quality Control Standard will be acceptable, subject to review by the Departmental Representative.
- .3 The Quality Control Manual shall include the following information:
  - .1 Distribution list, providing a list of names to whom the Manual shall be distributed;
  - .2 Title page, identifying the Contract, Contractor and copy number;
  - .3 Revision page, identifying the revision number and date of the Manual;
  - .4 Table of contents;
  - .5 Revision control, tabulating the revision number, date of revision, description of revisions and authorized signature;
  - .6 Details of measuring and testing equipment including methods and frequency of calibration;
  - .7 Purchasing details of all materials and equipment including procurement documents and vendor's Quality Control Program standards;
  - .8 Procedures for inspection of incoming items, in-process inspection and final inspection and tagging of all supply items;
  - .9 Details of special processes as identified by the Departmental Representative, including qualifications of personnel and certification;
  - .10 Procedures for shipping, packaging and storage of materials;
  - .11 Procedures for maintaining quality records and Statements of Compliance, including filing and storage of documents for a period of one year after Completion of the Works;
  - .12 Details of any non-conformance, including identification and recording of deficiencies, tagging procedures for "HOLD" or "REJECT" items, and final disposition of non-conformance forms by the Quality Control Manager;

- .13 Inspection and test checklists, including tabulated checklists describing all manufacturing and delivery activities such as Inspection or Test, frequency of tests, description of tests, acceptance criteria of tests, such as verification, witnessing or holding tests and sign-off by the Quality Control Manager and the Departmental Representative, if the Departmental Representative witnesses the tests; and
- .14 Forms used to ensure the application of the inspection and test checklist requirements. These forms shall be identified in the checklists and describe all testing requirements for Specification compliance.
- .4 The Contractor shall appoint a full time qualified and experienced Quality Control Manager, 100% of his time dedicated to quality matters and who will report regularly to the Contractor's management at a level that shall ensure that Quality Control requirements are not subordinated to manufacturing, construction or delivery. The Quality Control Manager shall be empowered by the Contractor to resolve quality matters.
- .5 The Quality Control Manual shall include samples of all forms to be filled in by the Quality Control Inspectors. All forms shall be signed by the Quality Control Manager and submitted promptly to the Departmental Representative who will add its review signature.
- .6 An independent check of all Work shall be performed by the Contractor. The Contractor shall appoint Quality Control Inspectors to ensure compliance of products and workmanship with Contract requirements. The same personnel may not be used to perform a given task and to check the quality and accuracy of the task.
- .7 At completion of the Work a bound and itemized copy of all Quality Control documents and reports shall be prepared by the Contractor's Quality Manager and submitted to the Departmental Representative.

## **1.6 INSPECTION**

- .1 All quality control testing required for this contract is the Contractor's responsibility. The Contractor shall engage a certified materials testing firm to conduct quality control testing. All costs incurred related to quality control testing are at the Contractor's expense with no additional payment being made. The Departmental Representative may engage an independent testing firm to conduct random quality assurance testing. Costs for quality assurance testing will be incurred by the Departmental Representative.
- .2 Allow Departmental Representative / testing agencies 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.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .4 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.
- .5 Departmental Representative will order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such Work is found not in accordance with Contract Documents, 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.

- .6 The Departmental Representative will provide the Contractor with an Approval to Proceed document, after performing an audit and confirming all requirements are met. The Approval to Proceed must be signed by the Departmental Representative and the Contractor's representative before proceeding to the next layer.

## **1.7 INDEPENDENT INSPECTION AGENCIES**

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

## **1.8 PROCEDURES**

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site.

## **1.9 NON-CONFORMANCES**

- .1 Contractor's Internal Non-Conformance Report (NCR):
  - .1 Should the Contractor's QC reporting indicate that the Work is not in conformance, the Contractor's QC Manager shall issue an internal Non-Conformance Report (NCR) to the Contractor, with a copy to the Departmental Representative, including a response time.
  - .2 The Contractor shall then respond to the QC Manager, with a copy to the Departmental Representative, with respect to the NCR, within the specified time, with proposed resolutions and corrective actions. The Contractor and/or the QC Manager shall consult with the Departmental Representative on the resolutions.
  - .3 The Departmental Representative will accept or reject the proposed resolution and corrective action proposal.
  - .4 Payment for the Work itself may be withheld until the NCR issue is resolved.

- .2 Owner Issued NCR:
  - .1 Should the Quality Assurance reporting indicate that the Work is not in conformance, the Departmental Representative will issue to the Contractor a NCR, including a response time.
  - .2 The Contractor shall then respond to that NCR, within the specified time, with proposed resolutions and corrective actions.
  - .3 The Departmental Representative will accept or reject the proposed resolution and corrective action proposal.
  - .4 Assurance testing and inspection will be performed to determine if the corrective action has provided an acceptable product. Acceptance and rejection will continue until the Departmental Representative determines that a quality product has been achieved.
  - .5 Payment for the Work itself may be withheld until the NCR issue is resolved.
- .3 The Completion Certificate will not be issued if there are any unresolved Non-Conformance Reports.
- .4 Appealing an NCR:
  - .1 If the Contractor disputes the validity of a finding in an NCR, the Contractor may file an appeal with the Departmental Representative. The Departmental Representative and the Contractor Representative will use all reasonable efforts to refine the area of dispute and to resolve the determination of conformance with the Contract.
  - .2 If the Departmental Representative and the Contractor Representative cannot come to a mutually agreeable resolution, the Work that is the subject of the Non-Conformance Report shall be re-evaluated by an independent third-party, selected by the Departmental Representative in consultation with the Contractor, at a test frequency equivalent to twice that specified in the Contract or to such other frequency as may be mutually agreed between the Departmental Representative and the Contractor.
  - .3 If the appeal testing confirms the non-conformance determination, all appeal testing costs will be borne by the Contractor. If the appeal testing shows that the Work did in fact meet the requirements of the Contract, all appeal testing costs will be borne by the Owner.

#### **1.10 OPPORTUNITIES FOR IMPROVEMENT**

- .1 Should the QA review indicate that the Work is not in conformance, but the variance is deemed minor by the Departmental Representative, the Departmental Representative may issue an Opportunity for Improvement (OFI) report.
- .2 The Contractor is encouraged to review the findings and undertake such modifications to the QC Plan and the work procedures as necessary to address the issue.

**1.11 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 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 Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.

**1.12 REPORTS**

- .1 Submit one (1) electronic copy of all inspection and test reports to Departmental Representative in accordance with Section 01 33 00 – Submittal Procedures
- .2 Provide copies to subcontractor of work being inspected or tested.

**1.13 TESTS AND MIX DESIGNS**

- .1 Furnish test results and designs as may be requested

**1.14 MILL TESTS**

- .1 Submit mill test certificates as required of specification sections

**2. PRODUCTS**

**2.1 NOT USED**

- .1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 INSTALLATION AND REMOVAL**

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

**1.2 DEWATERING**

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

**1.3 WATER FOR COMPACTION**

- .1 Contractor shall source water required for compaction and obtain all necessary permits.

**1.4 TEMPORARY POWER AND LIGHT**

- .1 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .2 Provide and maintain temporary lighting throughout project, as required.

**1.5 FIRE PROTECTION**

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and by-laws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

**2. PRODUCTS**

**2.1 NOT USED**

- .1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 DESCRIPTION**

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

**1.2 CONSTRUCTION ACCESS AND PARKING**

- .1 Provide Traffic Management Plan for review by Departmental Representative.
- .2 All work limits, staging areas, and access points to be reviewed and approved by Departmental Representative.
- .3 Provide and maintain adequate access to project site.

**1.3 INSTALLATION AND REMOVAL**

- .1 Prepare site plan indicating proposed location and dimensions of area to be used by Contractor, number of trailers to be used, avenues of ingress/egress.
- .2 Provide construction facilities in order to execute Work expeditiously.
- .3 Remove from site all such Work after use.

**1.4 SITE STORAGE/LOADING**

- .1 Confine Work and operations of employees within project limits. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with a weight or force that will endanger Work.
- .3 The areas west of the barn at STA 1+500 within the fenced enclosure is available for staging and storage

**1.5 SANITARY FACILITIES**

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances. These facilities shall be reasonably located to the work area to promote use. If non-portable, a vehicle shall be made available for staff to travel to the washroom facilities.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

**1.6 CLEAN UP**

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from removal activities that are salvageable.

.4 Stack stored new or salvageable material not in construction facilities.

**2. PRODUCTS**

**2.1 NOT USED**

.1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

.1 Not used.

**END OF SECTION**



**1. GENERAL**

**1.1 REFERENCES**

- .1 If there is question as to whether products or systems are in conformance with applicable standards, the Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .2 Cost for such testing will be paid by the Departmental Representative in event of conformance with Contract Documents or by the Contractor in event of non-conformance.

**1.2 QUALITY**

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with the Departmental Representative based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

**1.3 STORAGE, HANDLING AND PROTECTION**

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required for Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

- .6 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .7 Remove and replace damaged products at own expense and to satisfaction of the Departmental Representative.
- .8 Touch-up damaged factory finished surfaces to the Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

#### **1.4 TRANSPORTATION**

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by the Departmental Representative. Unload, handle and store such products.

#### **1.5 MANUFACTURER'S INSTRUCTIONS**

- .1 Unless otherwise indicated in specifications install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify the Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that the Departmental Representative may establish a course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

#### **1.6 QUALITY OF WORK**

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify the Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. The Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with the Departmental Representative, whose decision is final.

#### **1.7 REMEDIAL WORK**

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

#### **1.8 FASTENINGS**

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.
- .7 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .8 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .9 Bolts may not project more than one diameter beyond nuts.
- .10 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

## **1.9 EXISTING UTILITIES**

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, building occupants and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

## **2. PRODUCTS**

### **2.1 NOT USED**

- .1 Not used.

## **3. EXECUTION**

### **3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 PROJECT CLEANLINESS**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 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.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 The Contractor shall provide on-site bear proof containers required for collection of waste materials and debris.
- .5 The Departmental Representative and Environmental Surveillance Officer may, at their total discretion, require the Contractor to suspend work activities until such a time as the Work Site is cleaned and debris, waste, and animal attractants are satisfactorily managed. The Contractor shall do as requested at their cost and no claim for time or additional costs will be accepted.

**1.2 FINAL CLEANING**

- .1 When Work is Substantially Performed 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 and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by Owner 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.

**1.3 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling in accordance with Section [01 74 21 - Construction/Demolition Waste Management and Disposal].

**2. PRODUCTS**

**2.1 NOT USED**

.1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

.1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 WASTE MANAGEMENT GOALS**

- .1 Waste is to be managed as per the Environmental Protection Plan.
- .2 PCA's Waste Management Goal is that project waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
- .3 Accomplish maximum control of solid construction waste.
- .4 Preserve environment and prevent pollution and environment damage.

**1.2 DISPOSAL OF WASTES**

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner into waterways, storm, or sanitary sewers.
- .3 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .4 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, and packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .5 Unused material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .6 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by the Departmental Representative.
- .7 Do not dispose of preservative treated wood through incineration.
- .8 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .9 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by the Departmental Representative.
- .10 Fold up metal banding, flatten and place in designated area for recycling.
- .11 Cigarette butts shall be strictly controlled and disposed of offsite.

**1.3 USE OF SITE AND FACILITIES**

- .1 Execute work with least possible interference or disturbance to normal use of premises.

**1.4 SCHEDULING**

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

**2. PRODUCTS**

**2.1 NOT USED**

- .1 Not used.

**3. EXECUTION**

**3.1 APPLICATION**

- .1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

**END OF SECTION**

**1. GENERAL**

**1.1 INSPECTION AND DECLARATION**

- .1 Contractor's Inspection: Contractor and all Subcontractors to conduct an 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's Inspection.
- .2 Departmental Representative's Inspection: Departmental Representative and Contractor will inspect work and identify defects and deficiencies. Contractor shall correct Work as directed.
- .3 Completion: submit written certificates in English that tasks have been performed as follows:
  - .1 Work has been completed and inspected for compliance with Contract Documents.
  - .2 Defects have been corrected and deficiencies have been completed.
  - .3 Equipment and systems have been tested and are fully operational.
  - .4 All required certificates have been submitted.
  - .5 Operation of systems have been demonstrated to Owner's personnel.
  - .6 Work is complete and ready for Final Inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

**2. PRODUCTS**

**2.1 NOT USED**

- .1 Not used.

**3. EXECUTION**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**



**1. GENERAL**

**1.1 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3 Copy will be returned after Departmental Representative's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four (4) final copies of operating and maintenance manuals in English.
- .6 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .7 Furnish evidence, if requested, for type, source and quality of products provided.
- .8 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .9 Pay costs for transportation.
- .10 As-built survey data and redlined drawings to be provided within four (4) weeks of Construction Completion.

**1.2 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. Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title "Project Record Documents"; list title of project and identify subject matter of contents.
- .5 Arrange content by systems under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.

- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size and text pages.

### **1.3 CONTENTS – EACH VOLUME**

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

### **1.4 AS-BUILTS AND SAMPLES**

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
  - .1 Contract drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.

- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible conditions. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

### **1.5 RECORDING ACTUAL SITE CONDITIONS**

- .1 Record information on set of blue line opaque drawings provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .3 Field changes of dimension and detail.
  - .4 Changes made by change order.
  - .5 Details not on original Contract Drawings.
  - .6 References to related shop drawings and modifications.
- .5 Specifications; mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .6 Other documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

- .7 Provide digital photos, if requested, for site records.

## **1.6 WARRANTIES AND BONDS**

- .1 Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:
  - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
  - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
  - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) days after completion of applicable item of work.
  - .4 Verify that documents are in proper form, contain full information, and are notarized.
  - .5 Co-execute submittals when required.
  - .6 Retain warranties and bonds until time specified for submittal.

## **2. PRODUCTS**

### **2.1 NOT USED**

- .1 Not used.

## **3. EXECUTION**

### **3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**1. GENERAL**

**1.1 DESCRIPTION**

- .1 Supply and installation of new roadway signage
- .2 Relocation and or disposal of existing signage

**1.2 MEASUREMENT AND PAYMENT**

- .1 Signage will be measured and paid for per sign supplied and installed as measured by the Departmental Representative and paid under "Supply and Installation of Signs". Payment shall be full compensation for all labour, material, equipment, and incidentals required for the supply and installation of all traffic signage including signs, posts, and mounting hardware.
- .2 Relocation of existing signage will be measured and paid for per sign removed, salvaged and relocated as measured by the Departmental Representative and paid under "Remove, Salvage, and Reinstallation of Existing Signs". Payment shall be full compensation for all labour, material, equipment and incidentals required for the removal and salvage of existing signage, removal and disposal of existing posts, supply and installation of same number of new sign posts and reinstallation of the salvaged sign on new posts.
- .3 Removal of existing signage will be measured and paid for per sign removed and disposed as measured by the Departmental Representative and paid under "Remove and Dispose of Existing Signs". Payment shall be full compensation for all labour, material, equipment, and incidentals required to remove and dispose of existing signage including backfill and compaction of any resulting post holes.

**2. PRODUCTS**

**2.1 GENERAL**

- .1 All signs supplied shall be clearly marked on a weatherproof label, with the following information:
  - .1 Manufacturer's Name or Trade Mark
  - .2 Date of manufacture
  - .3 Type of sheeting material
- .2 Sign patterns shall conform to the Uniform Traffic Control Devices of Canada Sign Pattern Manual.
- .3 All lettering on signs shall conform to the series Type Highway Font from the Standard Alphabet for Highway Signs, from Federal Highway Administration (CHTO-20), Washington, DC, 20590 unless otherwise specified by the Uniform Traffic Control Devices of Canada Sign Pattern Manual.
- .4 All new signs shall be the minimum size as noted in the Manual of Uniform Traffic Control Devices of Canada and manufactured on aluminum backing.

- .5 Signs shall be either bilingual or of a symbolic or pictorial type.
- .6 Wood posts shall be new pine or spruce structural framing No. 2 or better, as per NLGA 1980 Rules Par. 123C and CCA (Copper, Chromate, Arsenate) pressure treated in accordance with CSA 080.14 and CSA 081.1. Posts shall be 100mm x 100mm for signs less than 0.5 m<sup>2</sup> in cross-section. Posts for larger signs shall be 100mm x 150mm in cross-section.

### **3. EXECUTION**

- .1 Existing signs to be removed and re-installed shall be carefully salvaged and installed on new wooden posts. Contractor to backfill resultant hole with suitable backfill material compacted in thin lifts.
- .2 New sign posts to be installed plum and within 1.5 degree of vertical.
- .3 Sign posts larger than 100 mm x 100 mm shall be weakened as showing on the Drawing.
- .4 Installed signs to be clean and not bent or twisted. The reflectorized surface shall be free of scratches and marks and must be securely fastened to the post.

**END OF SECTION**

**1. GENERAL**

**1.1 DEFINITIONS**

- .1 Clearing consists of cutting off trees and brush vegetative growth to within 300mm of the ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.
- .2 Grubbing consists of excavation and disposal of stumps and roots to a depth of 200mm below existing ground surface.

**1.2 PROTECTION**

- .1 Prevent damage to fencing, trees, landscaping, natural features, bench marks, existing buildings, utility lines, site appurtenances, water courses and root systems of trees which are to remain. All damage incurred shall be repaired by the Contractor at his expense.

**1.3 MEASUREMENT AND PAYMENT**

- .1 Clearing and Grubbing will be measured for payment by square metres based on horizontal measurements within the limits indicated and paid under bid item "Clearing and Grubbing". Payment shall be full compensation for all labour, material, equipment and incidentals required to clear and grub within indicated areas and dispose of materials off-site. No allowance will be made for uneven or sloping ground.

**2. PRODUCTS**

**2.1 NOT USED**

- .1 Not used.

**3. EXECUTION**

**3.1 PREPARATION**

- .1 Inspect site and verify with Departmental Representative items designated to remain.
- .2 Locate and protect utility lines: preserve in operating condition active utilities traversing site.
  - .1 Notify Departmental Representative immediately of damage to or when unknown existing utility line(s) are encountered.
- .3 Notify utility authorities before starting clearing and grubbing.
- .4 Keep roads free of dirt and debris.

### **3.2 CLEARING**

- .1 Clearing includes felling, trimming, and cutting of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within cleared areas.
- .2 Clear as indicated by Departmental Representative, by cutting at height of not more than 300 mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 1000 mm above ground surface.

### **3.3 GRUBBING**

- .1 Remove and dispose of roots larger than 7.5 cm in diameter, matted roots, and designated stumps from indicated grubbing areas.
- .2 Grub out stumps and roots to not less than 300 mm below finished grade.
- .3 Fill depressions made by grubbing with suitable material and to make new surface conform with existing adjacent ground surface.

### **3.4 REMOVAL AND DISPOSAL**

- .1 Remove cleared and grubbed materials offsite.
- .2 Debris shall not be deposited on adjacent lands.
- .3 Burning or burying of material will not be permitted.

### **3.5 FINISHED SURFACE**

- .1 Leave ground surface in condition suitable for immediate grading operations to approval of Departmental Representative.

**END OF SECTION**



**1. GENERAL**

**1.1 DESCRIPTION**

- .1 Stripping topsoil and subsoil within the grading limits as shown on the drawings.
- .2 Furnishing all labour, equipment, and materials for execution and hauling to stockpiles of all works specified including all incidental work.
- .3 Separate stockpiling or windrowing of the topsoil and subsoil.
- .4 All equipment will arrive clean and free of soil and vegetation material. Additional cleaning of soil handling equipment on-site may be required at the direction of the Departmental Representative.
- .5 Careful handling of subsoil and topsoil to control for wind and water erosion.
- .6 Stockpile surplus topsoil and seed as directed by the Departmental Representative.

**1.2 DEFINITIONS**

- .1 Topsoil:
  - .1 The top layer of soil containing organic material capable of supporting good vegetative growth and suitable for use in landscaping and seeding.
- .2 Subsoil:
  - .1 Soil located immediately below the topsoil, usually characterized by higher clay content and a lighter colour than the soil immediately below.

**1.3 MEASUREMENT AND PAYMENT**

- .1 Topsoil and subsoil stripping will be measured for payment in cubic metres based on the actual excavated volume as measured in the cut and paid under bid item "Stripping". Stripping includes supply of all labour, material, equipment and incidentals to excavate all topsoil and subsoil to specified lines and grades, including any borrow sources, remove and dispose of deleterious materials, and place suitable material into windrows, to the satisfaction of the Departmental Representative.
- .2 Topsoil – Surplus to Stockpile will be measured for payment in cubic metres based on the actual excavated volume as measured in place in the cut and paid under "Topsoil– Surplus to Stockpile". Payment includes supply of all labour, material and equipment to load from windrows, haul to designated stockpile areas, and place material in a neatly shaped stockpile to the satisfaction of the Departmental Representative, regardless of method used to transport material. Unsuitable materials will be disposed offsite or blended into existing grade on site as directed by the Departmental Representative.

**2.        PRODUCTS**

**2.1       NOT USED**

- .1    Not used.

**3.        EXECUTION**

**3.1       TEMPORARY EROSION AND SEDIMENT CONTROL**

- .1    Provide temporary erosion and sedimentation control measures in accordance with section 01 35 43 – Environmental Procedures.

**3.2       STRIPPING OF TOPSOIL/SUBSOIL**

- .1    Contractor to confirm existing topsoil depths by shovel tests in Highland section and provide information to the Departmental Representative prior to commencing stripping activities.
- .2    Remove topsoil and subsoil before construction procedures commence to avoid compaction of materials.
- .3    Excavate topsoil/subsoil as close as is practicable to the lines and grades shown on the Drawings, or as required by the Departmental Representative.
- .4    Topsoil/subsoil will be stripped to a depth that will ensure complete removal of all organic materials.
- .5    Stripped topsoil/subsoil to be placed on the disturbed roadside slopes shall be windrowed. At the direction of the Departmental Representative, stripped topsoil/subsoil in excess of the quantity required for the roadside slopes shall be stockpiled in areas designated by the Departmental Representative
- .6    Topsoil stockpile must be placed on an unstripped topsoil area.
- .7    Special care must be taken to avoid mixing topsoil with the underlying soil. The Departmental Representative may require that the Contractor provide a separate stockpile for topsoil contaminated with common material. Protect stockpiles from contamination and compaction.
- .8    The soils within this project are very fine and susceptible to wind erosion. Area is prone to high winds.
- .9    Where possible temporarily store suitable material in low profile windrows to be used later within project limits.
- .10   Stockpiled soils, particularly over winter months, will require suitable measures such as a strong tackifier to prevent erosion.

**END OF SECTION**

**1. GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 31 14 13 Soil Stripping and Stockpiling
- .2 Section 32 91 19.13 Topsoil Placement

**1.2 DESCRIPTION**

- .1 Submit reclamation plan to be reviewed and approved by Departmental Representative.
- .2 Surveying and staking all excavation and embankments.
- .3 Excavation to lines, grades and elevations shown on the drawings.
- .4 Supply and installation of all erosion and sediment control including silt fence as required in areas of fill and near water bodies.
- .5 Construction of embankments to lines, grades and elevations shown on the drawings.
- .6 Excavation and removal of unsuitable materials such as vegetation, roots, stumps and refuse from excavation to designated areas on site as directed by Departmental Representative.
- .7 Placement and compaction of material in fills and embankments to a minimum of 98% Standard Proctor Density or as shown on the drawings.
- .8 Contractor is responsible for the performance of quality control measures.
- .9 Watering for compaction.
- .10 Excavation, scarification and recompaction of all areas noted on the construction drawings.
- .11 Ditch construction, trimming and clean-up.
- .12 Construct rock check dams.
- .13 Perform any dewatering required before or during construction, levelling, and grading.
- .14 Disposal of unsuitable materials as directed.
- .15 Survey required to verify measurement for payment, and
- .16 Provision of all labour, materials and equipment required to complete the work as specified.

**1.3 DEFINITIONS**

- .1 Common Excavation:

- .1 All excavated material such as earth, clay, hardpan, soft shale, sand, gravel, or frozen earth.
- .2 Subgrade Preparation
  - .1 Prior to the deposition of any material on the subgrade, the subgrade shall be prepared to the satisfaction of the Departmental Representative and in accordance with the provisions specified.
- .3 Rock Check Dams
  - .1 Rock check structure constructed in roadway ditches to decrease flow velocities and to reduce erosion.
- .4 Unsuitable Materials: Unsuitable materials are materials other than organic materials that are, in the opinion of the Departmental Representative, not suitable for use in roadway subgrade, embankments or fills.

#### **1.4 MEASUREMENT AND PAYMENT**

- .1 Common Excavation will be measured for payment in cubic metres based on the actual excavated volume as measured in place in the cut and paid under "Common Excavation". Common Excavation includes supply of all labour, material and equipment to excavate all materials within the site limits, transport material, regardless of method used to transport, and construct all fills and embankments within the site limits. Unsuitable materials will be disposed offsite or blended into existing grade on site as directed by the Departmental Representative. No additional measurement and payment will be made for benching into existing slopes.
- .2 Common Excavation – Surplus to Stockpile will be measured for payment in cubic metres based on the actual excavated volume as measured in place in the cut and paid under "Common Excavation – Surplus to Stockpile". Common Excavation – Surplus to Stockpile includes supply of all labour, material and equipment to excavate all materials within the site limits, haul to designated stockpile areas, and place material in a neatly shaped stockpile to the satisfaction of the Departmental Representative, regardless of method used to transport material. Unsuitable materials will be disposed offsite or blended into existing grade on site as directed by the Departmental Representative.
- .3 Preparation of Subgrade will be measured in square metres and paid under "Subgrade Preparation". Subgrade Preparation includes all labour, material, equipment, proof rolling as requested, and incidentals required to complete the work. No payment will be made for additional preparation, conditioning or re-working as a result of weather conditions.
- .4 Rock check dams will be measured per check dam installed and paid under "Rock Check Dams". Rock check dams includes full compensation to supply and place pit run rock including geotextile for material separation as shown on Standard Drawing No. 19 – Rock Check Dams; and all labour, material, equipment, and incidentals required to complete the work.
- .5 Grading for subcuts, where required, will be measured for payment as Common Excavation.

- .6 Construction, maintenance and rehabilitation (including topsoil removal/replacement and any grubbing and clearing) of the Contractor's haul roads are incidental to the work.
- .7 Overhaul, over excavation and erosion and sediment control measures are considered incidental and no separate payment will be made.

## **1.5 PROTECTION**

- .1 Contractor will be responsible for locating and protecting all existing underground and surface structures, utility pipelines, overhead lines and poles, fences, building services, cables, culverts and other works. Contractor will repair all damage incurred at his expense.

## **2. PRODUCTS**

### **2.1 MATERIALS**

- .1 Acceptance of material at source does not preclude future rejection if the material is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory.
- .2 Rock check dams to consist of clean free draining pit run rock, free of vegetative material or soil, with a uniform gradation of material consisting between 75 mm to 300 mm diameter.  $D_{50}$  of material shall be 150mm

### **2.2 GEOTEXTILE**

- .1 Geotextile: in accordance with 31 32 19.1 - Geotextile

## **3. EXECUTION**

### **3.1 GENERAL**

- .1 The Hillside road is expected to generate an excess of material. Excess material is to be stockpiled at the location shown on the drawings and as approved by the Departmental Representative.
- .2 The Highland section is generally balanced between cut and fill. Any material shortfalls may be obtained from the surplus stockpile location.
- .3 The following quantities, based on design estimates, are provided for information purposes only. Final payment will be made on the basis of actual measured quantities of work.

STA to STA	Adjusted Fill (m <sup>3</sup> )	Cut (m <sup>3</sup> )
0+755 to 3+807	11850	12120
5+382 to 5+790	2010	1620
6+195 to 6+463	1740	2480

### **3.2 GRADING**

- .1 Grading shall include the removal and/or satisfactory placement of all materials necessary for the construction and preparation of embankment, slopes, drainage works, alignment, grade and cross-section shown on the Drawings or as required by the Departmental Representative.
- .2 Unless otherwise specified, where the proposed roadway subgrade elevation is less than 0.60m above the existing ground, the material shall be subcut to a depth of at least 0.30m, or as directed by Departmental Representative. Subcut areas shall be brought back to grade using common material conditioned and compacted to a minimum 98% Standard Proctor Density at plus or minus 2% optimum moisture content.
- .3 All soft and yielding material, if so directed by Departmental Representative, shall be removed and replaced with acceptable material, and all loose stone, clods, weeds, trash, etc. shall be removed from side slopes, ditches and back slopes. All improperly compacted material shall be excavated, brought to optimum moisture content if required, and recompacted at Contractor's own expense. On the side slopes and back slopes, and in the bottom of ditches, all projecting boulders must be removed or broken off at least flush with the lines and grades, and the resultant cavities, if any, backfilled.

### **3.3 EMBANKMENTS**

- .1 Embankment shall be constructed by depositing, shaping and compacting acceptable excavated material. The embankments shall be constructed above the natural ground or other level as required by the Departmental Representative, in conformity with the lines, grades and cross-sections shown on the Drawings.
- .2 All suitable material from excavations shall be used in forming embankments or shall be otherwise transported to stockpile as Department Representative may require.
- .3 Embankment shall be formed of suitable unfrozen material. Stumps, trees, rubbish, sod, topsoil or other unsuitable material shall not be placed in the embankment.
- .4 Embankment material shall not be placed on frozen earth, snow or ice, nor shall frozen soils, ice or snow be placed in any embankment. Any frozen material in the embankment shall be removed and disposed of at Contractor's expense before proceeding with further embankment construction.
- .5 When embankments are to be made on a hillside which will preclude a proper bond between the existing and newly placed material, in the opinion of the Departmental Representative, the existing ground on which the embankment is to be placed shall be benched before embankment construction is commenced.
- .6 Embankment shall be constructed so that after settlement is complete the required grade and cross section is attained at all points. If at any time before final acceptance of the work the embankment settles below the required grade, it shall be brought back to the required grade by the Contractor.

### **3.4 SCARIFICATION AND RECOMPACTION (SUBGRADE PREPARATION)**

- .1 Scarification shall be performed to 150 mm depth. Where the depth of scarification as directed by the Departmental Representative exceeds 150 mm, the material shall be excavated and replaced in 150 mm lifts.
- .2 Scarified areas shall be recompact to a minimum of 98% Standard Proctor Density at plus or minus 2% optimum moisture content. Where the areas to be recompact exceed 150 mm, the material shall be replaced in 150 mm (compacted) lifts.

### **3.5 EMBANKMENT COMPACTION**

- .1 All material placed in embankments shall be spread and bladed smooth in successive layers, not to exceed 150 mm in depth when compacted and to the full width of the cross-section. Where the embankment to be placed traverses muskeg or yielding ground and it is not possible to place the initial embankment lift in a 150 mm compacted depth, the Contractor may, upon approval of the Departmental Representative, construct the first embankment lift to a depth sufficient to support the construction equipment. Each layer shall be compacted by means approved by the Departmental Representative to a minimum of 98% Standard Proctor Density. The material in each layer shall be compacted to the optimum moisture content plus or minus 2%, unless otherwise required by the Departmental Representative. The degree of compaction and/or moisture content will be determined by insitu density testing before the succeeding layer is placed at the Departmental Representative's discretion.
- .2 Compaction over the entire surface area of each layer shall be obtained by equipment to meet the specified density requirements. Hauling equipment will not be accepted in lieu of compaction equipment. Compaction to the specified density shall be obtained uniformly throughout each layer.
- .3 Where moisture content tests indicate that material being used for embankment is above optimum moisture content, the material shall be thoroughly worked until its optimum moisture content is reached or as directed by the Departmental Representative.
- .4 Where moisture content tests indicate the material for embankment is below optimum moisture, water shall be added. The material shall be thoroughly disced and broken down, water added in amounts as required, and the material thoroughly worked to mix the water uniformly throughout the soil prior to commencing compaction operations. The type of water hauling and spraying equipment used shall be satisfactory to the Departmental Representative.

### **3.6 ROCK CHECK DAMS**

- .1 Excavate a trench key a minimum of 0.10 m in depth at the rock check structure locations.
- .2 Place non-woven geotextile fabric over footprint area.
- .3 Construct structure by machine or hand
- .4 Structure to be constructed so that the centre of the crest is depressed to form a centre flow width which is a minimum of 0.3 m lower than the outer edges.

- .5 Downstream slope of check dam to be 5H:1V (minimum)
- .6 Upstream slope of check dam to be 4H:1V (minimum)

### **3.7 TESTING**

- .1 Testing of materials and compaction testing will be carried out by an independent testing company and paid for by the Contractor.
- .2 Compaction results shall be based on a minimum of one density test per 1500 square meters per lift of embankment.
- .3 When required by the Departmental Representative, the Contractor shall supply and operate a loaded test vehicle of 8200 kg axle load to test the subgrade for rutting, weaving and soft spots. Where proof rolling indicates areas that are defective, the Contractor shall remove and replace the material with suitable compacted material at his expense.
- .4 Field density tests shall conform with ASTM D1556, ASTM D2167, or ASTM D2922 for comparison with a maximum density determined according to ASTM D698 Method A.

### **3.8 FINISHING AND TOLERANCES**

- .1 Finished surfaces are to be within 15 mm of design grade.
- .2 Provide positive drainage to avoid standing water.

### **3.9 MAINTENANCE**

- .1 Maintain finished surfaces in a condition in accordance with this Section until succeeding material is applied or until acceptance.

**END OF SECTION**



**1. GENERAL**

**1.1 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with direction of Departmental Representative.
- .2 Divert leftover geotextiles to local plastic recycling facility as approved by Departmental Representative.

**1.2 ACTION AND INFORMATION SUBMITTALS**

- .1 Inform Departmental Representative at least (2) weeks prior to commencing Work, of the proposed manufacturer's product information.

**1.3 MEASUREMENT AND PAYMENT**

- .1 Geotextile required for rip rap installations at drainage culvert inlets and outlets and will be incidental to the culvert installation.
- .2 Geotextile required for rock check dam installations will be incidental to the check dam installation.

**2. PRODUCTS**

**2.1 GEOTEXTILE**

- .1 The synthetic non-woven geotextile shall consist of a durable, permeable, non-woven, polyester fabric composed of continuous synthetic filaments in a random arrangement with typical properties as follows:
  - .1 Tensile Grab Strength – ASTM D4632                      650 N
  - .2 Trapezoid Tear Strength – ASTM D4533                      250 N
  - .3 Mullen Burst Strength – ASTM D3786                      2,100 kPa
  - .4 Puncture – ASTM D4833                      275 N
- .2 Non-woven geotextile shall be Amoco 4551, Layfield 601 or approved equal

**3. EXECUTION**

**3.1 GEOTEXTILE**

- .1 Geotextile shall be used under all rip rap at culvert inlet and outlet locations and rock check dams.
- .2 Subgrade surface shall be smooth, well dressed and prepared in accordance with 31 22 15 Site Grading.

- .3 The fabric shall be laid parallel to the slope direction. It shall be placed in a loose fashion; however folds and wrinkles shall be avoided. Fabric shall be overlapped a minimum of 300mm as required.
- .4 Care shall be taken to prevent puncturing or tearing the geotextile.
- .5 The fabric shall be covered by rip rap within sufficient time to ensure ultraviolet damage doesn't occur.

**END OF SECTION**

**1. GENERAL**

**1.1 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with direction of Departmental Representative.
- .2 Divert leftover aggregate materials to locations as directed by Departmental Representative.

**1.2 ACTION AND INFORMATION SUBMITTALS**

- .1 Inform Departmental Representative at least (2) weeks prior to commencing Work, of the proposed source of rip rap and provide access for sampling.

**1.3 MEASUREMENT AND PAYMENT**

- .1 Rip rap required for Corrugated Steel Pipe (CSP) drainage culvert inlets and outlets and will be incidental to the culvert installation.

**2. PRODUCTS**

**2.1 RIP RAP**

- .1 Materials shall be resistant to weathering and water action. Sandstone or shale materials shall not be used.
- .2 Rip rap shall consist of a graded mixture of sound, durable stone or pit run gravel, free of vegetative material or soil .
- .3 Gradation of the mixture shall be such that 50 percent of the rip rap consists of material having at least a minimum dimension of 200mm.

**2.2 GEOTEXTILE**

- .1 Geotextile: in accordance with 31 32 19.1 - Geotextile

**3. EXECUTION**

**3.1 PLACEMENT**

- .1 Rip rap shall be hand laid at culvert inlets and outlets.
- .2 Place stones to secure surface and create a uniform stable mass to an average depth of 200mm.
- .3 Voids between stones shall be filled with spalls rammed into place.
- .4 Care shall be taken not to puncture the synthetic filter fabric when placing the rip rap. Any damaged filter fabric shall be repaired or replaced as requested by the Departmental Representative.

- .5 Finish surface evenly, free of large openings and neat in appearance.

**END OF SECTION**

## **1. GENERAL**

### **1.1 SUBMISSIONS**

- .1 At least 2 weeks prior to commencing work inform Departmental Representative of proposed source of granular materials and submit a sieve analysis of the material for the Departmental Representative's review.
- .2 Preliminary review of the material as represented in the test results shall not constitute general acceptance of all material in the deposit or source of supply. Materials may be considered unsuitable even though particle sizes are within the limits of the gradation sizes required, if particle shapes are thin or elongated or any other characteristic precludes satisfactory compaction or if the material fails to provide a roadway suitable for traffic. Rejected material will not be paid for. The Departmental Representative has the right to request additional testing if there are any concerns with the proposed aggregate.

### **1.2 MEASUREMENT AND PAYMENT**

- .1 Gravel Surfacing shall be measured in tonnes paid under "Gravel Surfacing". Payment will be full compensation for supply of aggregate, processing, hauling, minor reshaping of existing granular surface to achieve cross-fall, placing and shaping the gravel material. Costs associated with the supply of aggregate, including, but not limited to, environmental approvals, exploration, clearing, stripping, pit setup, pit reclamation, and security/safety requirements will be considered incidental to the work and no additional payment will be made

## **2. PRODUCTS**

### **2.1 GRAVEL SURFACING**

- .1 Material for gravel surfacing shall consist of sound, hard, well graded, durable crushed rock or crushed gravel and shall not contain organic or soft, thin, elongated, or laminated materials, materials that break up when alternately frozen and thawed or wetted and dried, or other deleterious materials. AT Designation 40 Class 20 is considered a suitable material for use.
- .2 Aggregate for gravel surfacing shall meet the following gradation as shown below:

Sieve Size (mm)	Percent Passing (by weight)
20	100
10	35-77
5	15-55
1.25	0-30
0.08	0-12

- .3 At least 40 percent by weight of material retained on the 5 mm sieve shall have two or more fractured faces.

### **3. EXECUTION**

#### **3.1 GENERAL**

- .1 Equipment used for shaping or for spreading gravel shall operate in the direction of normal traffic flow at all times.

#### **3.2 PLACING**

- .1 Prior to placement of new gravel, repair areas of the road in accordance with Section 31 22 15 – Site Grading as directed by the Departmental Representative.
- .2 Minor reshaping of the existing granular surface shall be completed prior to placement of new gravel, to achieve crossfall, as approved by the Departmental Representative.
- .3 Gravel placement to be controlled to prevent segregation and to distribute material uniformly across the roadway at the design depth.
- .4 The Contractor shall advise the Departmental Representative at least 48 hours prior to commencement of gravel surfacing operations to allow inspection of the prepared road surface. Gravel surfacing may proceed only on sections of road which have been approved by the Departmental Representative.
- .5 Gravel shall be promptly and uniformly spread, and in all cases shall be spread before darkness each day. Every precaution shall be taken by the Contractor to provide for the safety of traffic in the area of operations.
- .6 Once uniformly placed to design depth, lightly water and use steel drum roller, providing two full passes over entire surface for compaction.
- .7 After gravel surfacing is complete, the Contractor shall repair all damage to the shoulders or ditches resulting from his operations, leaving the road neatly trimmed and true to cross-section and grade.
- .8 The Contractor shall maintain the graveled surface until it is accepted by the Departmental Representative. Maintenance shall be at the Contractor's own expense and shall be carried out daily or at frequent intervals, depending upon the effects of traffic and weather upon the graveled sections of roadway.

#### **3.3 FINISHING AND TOLERANCES**

- .1 Finished surface to be within 15 mm of design grade

**END OF SECTION**

**1. GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 31 14 13 Soil Stripping and Stockpiling
- .2 Section 32 92 19.13 Seeding

**1.2 DESCRIPTION**

- .1 Survey and staking of areas to be topsoiled.
- .2 Loading, hauling, placing, levelling, fine grading of topsoil materials.
- .3 Reclamation and vegetation of:
  - .1 All work areas adjacent to the roadway
  - .2 The ditches of the new "highland" road alignment
  - .3 All work areas adjacent to the "hillside" portion of the road
  - .4 Any other disturbance areas (ie. staging areas)

**1.3 DEFINITIONS**

- .1 Topsoil:
  - .1 The top layer of soil containing organic material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .2 Subsoil:
  - .1 Soil located immediately below the topsoil, usually characterized by higher clay content or presence of roots and a lighter or darker colour than the soil immediately above or below.

**1.4 MEASUREMENT AND PAYMENT**

- .1 Topsoil, including the distribution of subsoil, will be measured by the cubic metre based on the original volume excavated and paid under "Topsoil Placement". Payment shall be full compensation for all labour, material, equipment and incidentals required to place from windrows and/or stockpiles, condition, shape and remove deleterious materials (rocks, grass, roots).

**2. PRODUCTS**

**2.1 TOPSOIL**

- .1 Topsoil to be obtained from onsite stripping operations as per Section 31 14 13 - Soil Stripping and Stockpiling and not from undisturbed areas, unless indicated by Departmental Representative.

**3. EXECUTION**

**3.1 TOPSOIL**

- .1 Topsoil and subsoil will be placed as specified by the Departmental Representative.
- .2 A minimum 150 mm layer of topsoil shall be placed on disturbed slopes in reconstructed areas, generally from STA 0+755 to 3+807, STA 5+382 to 5+790 and STA 6+195 to 6+463, and as required by the Departmental Representative. After placement, disc and harrow topsoil thoroughly.
- .3 Do not perform work under adverse field conditions, such as frozen soil. Excessively wet or dry soil or soil covered with snow, ice or standing water.
- .4 Verify that grades are correct. If discrepancies occur, notify the Departmental Representative and do not commence work until instructed by the Departmental Representative.
- .5 Following topsoil placement, temporary erosion control may be required until seeding and mulching can be undertaken.

**3.2 FINISHING AND TOLERANCES**

- .1 Finished surfaces are to be within 15 mm of design grade.

**END OF SECTION**



**1. GENERAL**

**1.1 RELATED WORK**

- .1 Section 31 22 15 Site Grading

**1.2 QUALITY ASSURANCE**

- .1 The Contractor must have experience at performing this type and scale of work and be willing to provide proof of this experience.
- .2 All equipment will be cleaned of soil and vegetation material between locations of work closest to the ranch boundary and the other locations due to the presence of non-native grasses in the work area closest to the ranch boundary.

**1.3 SCOPE OF WORK**

- .1 The Contractor shall furnish all labour, materials, equipment, and services necessary to complete the work as specified herein and as shown on the drawings. Areas where salvaged sod is to be placed shall be as indicated on the landscape plans which accompany the specifications as directed on the site by the Departmental Representative.
- .2 Work includes reclamation and revegetation of:
  - .1 All work areas adjacent to the roadway.
  - .2 The ditches of the new "highland" road alignment.
  - .3 All work areas adjacent to the "hillside" portion of the road.
  - .4 Any other disturbed areas (ie. staging areas).

**1.4 PRODUCT DELIVERY, STORAGE AND HANDLING**

- .1 Seed will be sourced from one of the following suppliers. Not all suppliers may have all required species and a combination of suppliers may be necessary:
  - .1 Brett Young Canada
  - .2 Eastern Slopes Rangeland Seeds
  - .3 Pickseed Canada
- .2 Seed shall be mixed and tested and clearly marked with the name of the supplier and the specified seed composition.
- .3 The Contractor shall supply the Departmental Representative with the certificates of analysis for all of the lots of seed used, a minimum of 14 days prior to purchase of any seed. Mixing of any seed mixes, or on-site seeding operations providing sufficient time for rejection. Seed analysis must include germination (germination and/or Tz analysis) completed within the 24

months of seeding and a weed analysis. No seed lot with provincially regulated weeds will be accepted. Seed lots with invasive grasses such as quack grass, smooth brome, and timothy will not be accepted.

- .4 The Contractor is responsible for ensuring seed is viable and stored in a cool dry place until planting. Any seed found to be mouldy, heated or otherwise damaged will be rejected by the Departmental Representative.
- .5 Deliver and store grass seed in original containers showing:
  - .1 Analysis of seed mixture
  - .2 Percentage of pure seed
  - .3 Year of production
  - .4 Net mass
  - .5 Date when tagged and location
  - .6 Percentage germination
  - .7 Name and address of distributor

## **1.5 MEASUREMENT AND PAYMENT**

- .1 Seeding will be measured in square metres of horizontal surface areas and paid under bid items for each seed mix "Seeding – Upland Mix" and "Seeding – Wet Ditch Mix". Payment will be full compensation to supply and place the seed regardless of methods outlined within this specification. If there is a discrepancy between drawings and field, the actual surface area in the field will be used.
- .2 Hydro-mulching will be measured in square metres of horizontal surface areas and paid under bid item "Hydro-mulching". Payment will be full compensation to supply and place the hydro-mulch regardless of methods outlined within this specification. If there is a discrepancy between drawings and field, the actual surface area in the field will be used.
- .3 Payment for seeding and hydromulching will not occur until Substantial Performance.

## **1.6 REFERENCES**

- .1 Prairie Roots: A Handbook for Native Prairie Restoration (NPSS).
- .2 Restoring Canada's Native Prairies: A Practical Manual by J. Morgan and others.
- .3 Alberta Weed Control Act, 2008 and related Regulations.
- .4 Alberta Invasive Plant Identification Guide 2013.

## 2. PRODUCTS

### 2.1 GRASS SEED

- .1 All seed will be planted on a pure live seed basis. This means the seed mix will be modified if seed germination is low for any particular seed lot or if there is a large amount of inert material in a seed lot.
- .2 All native seed must meet seed certificate minimum purity standards as set by the Canadian Methods and Procedures for Seed Testing and it is preferred that germination rates are above 70%, if lower the seed mix and seeding rate will be modified to account for this.
- .3 Seed is to be free of weeds listed under the Alberta Weed Control Act. Additional invasive species that may result in the rejection of a seed lot may be added by Departmental Representative.
- .4 In addition to 2.1.3 seed is to be free of: Kentucky bluegrass, quack grass, crested wheatgrass, creeping red fescue, sheep fescue, smooth brome, sweet clover, absinthe, star thistle, dalmatian toadflax, baby's breath, ox-eye daisy, burdock, common tansy, and canary reedgrass.
- .5 Supply 2 copies of seed certificates for each species of seed to the Departmental Representative.
- .6 Substitutions are to be approved by the Departmental Representative.
- .7 An Upland seed mix is specified for general application across the project. The following seed mix is provided to the Contractor only for purposes of cost estimation (based on the habitat of the general area of the project). Seeding will be completed with a brilliant drill where possible at the seeding rate of 19.00 kg/ha.

Target seeds/m <sup>2</sup>	Actual seeds/m <sup>2</sup>	Actual kg/ha (PLS)	Amount to Purchase (Kg/ha)
1500	1657.5	19.00	19.00

Scientific Name	Target Cover	Grazing Response	% of mix (PLS)	Kg/ha (PLS)
<i>Koeleria macrantha</i>	55%	Increaser - 1	12%	2.27
<i>Agropyron dasystachyum</i>	10%	Increaser - 1	16%	3.10
<i>Agropyron smithii</i>	10%	Increaser - 1	23%	4.34
<i>Stipa curtiseta</i>	10%	Increaser - 1	28%	5.34
<i>Stipa viridula</i>	15%	Decreaser	21%	3.96
	100%		100%	19.00

- .8 A Wet Ditch seed mix is specified for application in wetland/ephemeral drainage areas. The following seed mix is provided to the Contractor only for purposes of cost estimation (based on the habitat of the general area of the project). Seeding will be completed with a brilliant drill where possible at the seeding rate of 22.36 kg/ha.

Target seeds/m <sup>2</sup>	Actual seeds/m <sup>2</sup>	Actual kg/ha (PLS)	Amount to Purchase (Kg/ha)
1500	1690.50	22.36	22.36

Scientific Name	Target Cover	Grazing Response	% of mix (PLS)	Kg/ha (PLS)
<i>Poa palustris</i>	25%	Increaser - 1	4%	0.87
<i>Agropyron smithii</i>	20%	Increaser - 1	45%	9.98
<i>Bromus carinatus</i>	10%	Decreaser	27%	6.10
<i>Stipa viridula</i>	10%	Decreaser	14%	3.03
<i>Poa ampla</i>	10%	Decreaser	4%	0.87
<i>Deschampsia ceaspitosa</i>	25%	N/A	7%	1.51
	100%		100%	22.36

## **2.2 WATER**

- .1 Potable, free of impurities that would inhibit germination. The Contractor is responsible for supplying hoses if a water connection is available. If no such connection exists or connections have been shut off for seasonal purposes, it is the Contractor's responsibility to supply water via water truck for establishment of the grass at no additional cost to the client.

## **2.3 HYDRO-MULCH**

- .1 A strong tackifier will be used in the form of hydro-mulching as specified by the Department Representative throughout the reclamation areas. It is recommended that the product be Flex-terra or an equivalent material and applied at a minimum rate of 1500 kg/ha.

## **3. EXECUTION**

### **3.1 WORKMANSHIP**

- .1 Keep site well drained.
- .2 Clean up immediately soil or debris spilled onto pavement, dispose of deleterious materials. Verify that grades are correct. If discrepancies occur, notify the Departmental Representative and do not commence work until instructed by the Departmental Representative.

### **3.2 PREPARATION OF SURFACE**

- .1 Obtain Departmental Representative approval of topsoil grade and depth before starting seeding.
- .2 Verify control of weeds prior to laying topsoil. It is the Contractor's responsibility to use weed free soil and seed and is responsible for errors in judgement.
- .3 Drill seeding: After cultivation, seed with a billion seed drill.

### **3.3 SEEDING**

- .1 Use equipment suitable for area involved to the approval of the Departmental Representative. A brillion seed drill is to be used for seeding. Broadcast seeding is only acceptable where topography does not allow equipment to access the area.
- .2 When seeding native grasses add an inert carrier if required to allow the seed to flow through the drill. Suitable carries include vermiculite or coarse sand to the seed mix so that you can see where the seed has been spread.
- .3 Hydro-mulch the site immediately after seeding.
- .4 Native seed cannot be seeded deeply or it will not germinate. Do not place deeper than 10mm. Ensure the machinery is properly calibrated.
- .5 Weeds can be more easily identified if 2 or 3 small boards (1/2 m sq.) are placed in various locations on the site prior to seeding. Once the native seeds have germinated the boards are removed and marked with painted stakes. All the plants in these marked areas will be weeds. This will allow a plant comparison between the seeded area and non-seeded areas and a way of identifying weeds, as well as distinguishing between foreign grasses and native grass.
- .6 When fall seeding do not water seed bed.
- .7 Protect seeded areas against damage. Remove this protection after grass areas have been accepted by the Departmental Representative.
- .8 Seeding must be undertaken in the fall after September 15. Exceptions can occur where seed is irrigated. The areas to be reseeded should be kept moist until 2 weeks past germination and then watched during periods of drought. Seeding prior to a rain is advantageous.
- .9 Reseed at two week intervals where germination has failed. Do not reseed after June 15. Wait until the fall.
- .10 In the case of dormant seeding (late fall) protect seeded areas from pedestrian and vehicular damage.

### **3.4 MAINTENANCE DURING ESTABLISHMENT (8-12 WEEK PERIOD)**

- .1 Ensure maintenance equipment suitable to Departmental Representative.
- .2 Perform operations from time of seed application until acceptance by Departmental Representative.
- .3 Do not water fall seeding.
- .4 Repair and reseed dead or bare spots as soon as possible to allow establishment of grasses prior to acceptance.

- .5 Maintain grass free of pests and diseases utilizing acceptable integrated pest management practices.
- .6 Control annual weeds by cutting flower heads prior to forming seed. Annual weeds do not need to be removed. Set mower blades high, approximately 150 to 200mm, to cut flower heads but not the native grasses which will be very short in the first year. This may need to be done every second week depending on extent of weeds present.
- .7 Hand weeding of perennial weeds should be considered for smaller areas with few weeds.
- .8 Control perennial weeds by hand-pulling or spot-spraying 6-10 weeks after germination. Blanket spraying is to be considered when perennials weeds become denser than 50% of the area. Use a selective broadleaf herbicide to eliminate perennial invasive broadleaf plants such as Canada Thistle and other legislated weeds found in the Alberta Weed Control Act.

### **3.5 SUBSTANTIAL PERFORMANCE**

- .1 Native Areas seeding will be considered substantially performed by the Departmental Representative provided that seeded areas are properly established and:
  - .1 Turf is free of eroded, bare or dead spots and 98% free of weeds per Alberta Weed Control Act as well as the following invasive alien plants not on the list: Crested wheat grass, Smooth Brome, Foxtail Barley, Star Thistle, Sweet Clover, Absinthe, Dalmatian Toadflax, Baby's Breath, Ox-eye Daisy, Burdock, Common Tansy, and Canary Reed Grass.
  - .2 "Bare" will be determined by a count of plants. Density of native seedlings must be greater than 20 seedlings per sq.metre eight weeks after seeding. Plants will be counted in a sample area with the lowest germination.
  - .3 Annual weeds have been cut on a regular basis.
  - .4 Areas seeded in fall will be accepted in following spring, two months after start of growing season (April 15 - May 1) provided acceptance conditions are fulfilled.

### **3.6 NATIVE GRASS MAINTENANCE DURING WARRANTY PERIOD**

- .1 Perform operations from time of Substantial Performance until end of warranty period, which is one year unless otherwise stated in the tender documents.
- .2 Perform all operations noted in "Maintenance during Establishment" Section 3.6.
- .3 Do not water unless there is an extended drought period (less than 25mm (1") of rain for 4 weeks). Water will encourage weed growth. Water areas that have been reseeded.
- .4 Areas will not be cut except to control weeds and at the discretion of the client. Grass may have to be cut every second week.
- .5 Weed control is the main maintenance task during the warranty period. If annual weeds have not disappeared with cutting during the tenth month of the maintenance period,

chemical control may be required to meet maintenance acceptance. (In a two-year maintenance program continue annual weed control with cutting until the 20th month.)

- .6 Along with invoice provide Departmental Representative with monthly written notes on what procedures have been undertaken. If any issues appear meet with Departmental Representative on site. Notes to be provided within 10 days after the end of the month.
- .7 At the end of the warranty period meet with the Departmental Representative and Client to ensure maintenance acceptance.

### **3.7 MAINTENANCE ACCEPTANCE**

- .1 Maintenance Acceptance will occur at the end of the warranty period, which is one year from Substantial Performance unless otherwise stated in the tender documents.
- .2 Grass is free of eroded, bare, or dead spots and 98% free of all annual and perennial weeds.
- .3 "Bare" will be determined by a count of plants. Density of native seedlings must be greater than 60 seedlings per sq.metre. Plants will be counted in a sample area with the lowest germination.

**END OF SECTION**

**1. GENERAL**

**1.1 DESCRIPTION**

- .1 Removal and disposal of existing fencing
- .2 Supply and installation of new fencing
- .3 Supply and install gates
- .4 Remove, salvage and reinstall gates

**1.2 MEASUREMENT AND PAYMENT**

- .1 Removal and disposal of existing fencing will be measured per linear metre, regardless of type, as measured by the Departmental Representative and paid under "Remove and Dispose Fencing". Payment shall be full compensation for all labour, material, equipment and incidentals required to remove and dispose of all fence materials and components including bases, brackets, posts and gates and to install and compact suitable backfill material in all resulting post holes or excavations.
- .2 Fencing of each type will be measured per linear metre as measured by the Departmental Representative and paid under "Fencing – Paigewire" and "Fencing – Barbed Wire". Payment shall be full compensation for all labour, material, equipment, and incidentals required for the supply and installation of all line posts, corner posts, line and stay wires, gates as identified on drawings, wire mesh and incidentals necessary to complete the work to the satisfaction of the Departmental Representative.
- .3 Relocate Elk Control Gates will be measured per gate and paid under "Elk Control Gate". Payment shall be full compensation for all labour, material, equipment and incidentals required to remove, salvage and reinstall the gate at new location including replacing all damaged and unsalvageable posts, wire and hardware.
- .4 Barn Access Gates will be measured per gate and paid under "Barn Access Gate". Payment shall be full compensation for all labour, material, equipment and incidentals required to supply and install the gate including all posts, wire and hardware for a complete installation. No separate payment will be made for development and submission of proposed gate materials and layout information for Departmental Representative review and approval.
- .5 Steel Post Gates will be measured per gate and paid under "Steel Post Gate". Payment shall be full compensation for all labour, material, equipment and incidentals required to supply and install the gate including all posts, wire and hardware for a complete installation. No separate payment will be made for development and submission of proposed gate materials and layout information for Departmental Representative review and approval.

**2. PRODUCTS**

**2.1 ELK CONTROL GATE**

- .1 Relocation of Elk Control gates to include all related materials as shown on Standard Drawing No. 7 for a fully functioning gate.



## **2.2 BARN ACCESS GATE**

- .1 Barn Access Gate shall be double swing with a total opening width of 8.5m and an overall height matching the height of the fence in which the barn access gate is being installed.
  - .1 Gate frame shall be constructed of ASTM A120 galvanized steel to the manufacturer's standard for medium service applications.
  - .2 Gate fencing fabric shall be paige wire to match the fencing.
  - .3 Gate shall be designed and constructed with appropriate foundation and bracing details
  - .4 A locking mechanism shall be provided to connect the gate doors and drop pins on each gate door.
- .2 Contractor is responsible to submit gate details including proposed materials and layout information for Departmental Representative review and approval.

## **2.3 STEEL POST GATE**

- .1 Supply of Steel Post Gate to include all related materials as shown on Standard Drawing No. 21.
- .2 Steel gates shall be single swing with a total opening width of 6.0m. Gate frame shall be constructed of ASTM A120 galvanized steel to the manufacturer's standard for medium service applications.
- .3 Contractor is responsible to submit gate details including proposed materials and layout information for Departmental Representative review and approval.

## **2.4 WOOD POSTS**

- .1 Posts shall be of sound quality, free from all decay, shakes, splits or any other defects which would render them structurally unsuitable.
- .2 Wood posts and braces shall be fir or pine timber pressure treated with 50/50 creosote-petroleum solution or a chromated copper arsenate solution conforming to the requirements of the current edition of CSA Standard 080.

## **2.5 BARBED WIRE**

- .1 Supply of 3 line barb wire fence including all related materials as detailed on Standard Drawing No. 4.
- .2 Single strand barbed wire shall conform to ASTM Designation A121, "Standard Specifications for Zinc-Coated (Galvanized) Steel Barbed Wire" meeting the following minimum requirements:
  - .1 Measure of wire per spool – 402 m
  - .2 Minimum mass per spool – 24 kg

- .3 Wire thickness – 2.64 mm
- .4 Minimum tensile breaking strength of wire – 500 kg
- .5 Barb spacing – 125 mm
- .6 Number of points per barb – 4

## **2.6 PAIGE WIRE**

- .1 Supply of paige wire fence including all related materials as detailed on Standard Drawing No. 5.
- .2 Woven wire shall conform to “Standard Specification for Zinc-Coated (Galvanized) Iron or Steel Farm-Field and Railroad Right of Way Wire Fencing”, ASTM Designation A116, (Class 1 or better), except that Section 5 of the ASTM Specification shall be deleted and replaced with requirement pertaining to size and style of the woven mesh contain within these specifications.
- .3 Wire staples shall be standard 40 mm long staples, manufactured from 3.66 mm thick galvanized wire. There shall be approximately 140 staples per kilogram.

## **3. EXECUTION**

### **3.1 INSTALLATION**

- .1 All fencing work to be conducted under suitable dry or frozen conditions in order to avoid soil and vegetation damage. Any soil or vegetation damage will require reclamation in a manner approved by and to the satisfaction of the Departmental Representative.
- .2 Fencing installation to be co-ordinated to ensure pasture security is maintained as required. Contractor shall submit a plan to the Departmental Representative for approval identifying how the integrity of the pasture security will be maintained during fencing activities a minimum of one week prior to the work.

### **3.2 WOOD POSTS**

- .1 The posts shall be set in holes to the required depth; and tamped in a plumb and firm position to the lines and spacings shown or as directed by the Departmental Representative. Post holes shall be large enough to allow for proper tamping. Posts shall be set with the large end down.
- .2 Backfill shall be placed in layers not exceeding 0.15 m and compacted by hand tampers, machine tampers, or other suitable equipment. Completed backfill shall be crowned slightly to permit drainage away from the posts.
- .3 Driving of posts, including methods employing drilled pilot holes, will only be permitted if the results of these methods produces a satisfactory, uniform, undamaged, plumb installation with the post firmly implanted into the soil to the specified depth. If, in the opinion of the Departmental Representative, the results obtained from the driving of posts unsatisfactory, then this method shall be discontinued.

- .4 Sharpening of posts will not be permitted.
- .5 Intermediate brace posts shall be erected in conformance with the maximum spacing requirement and at any additional locations that may be designated by the Departmental Representative.
- .6 Backfill material for fence posts must be approved by the Departmental Representative

### **3.3 WIRE**

- .1 Fence wire shall be pulled tight with hand stretchers or other approved tensioning apparatus capable of adjustment. The use of tractors or trucks for tightening the fence wire will not be permitted unless the pull is controlled by an adjustable tensioning apparatus.

**END OF SECTION**

**1. GENERAL**

**1.1 DESCRIPTION**

- .1 Survey and staking.
- .2 Transportation, storage, common excavation, bedding, backfilling, riprap, geotextile, installation of couplings and bolts, labour and equipment.
- .3 Installation of a complete culvert assembly, including elbows and end sections, riprap complete with geotextile at inlet and outlet, installed as specified herein or as required by the Departmental Representative.
- .4 Repair and regrading of roads, walkways, ditches or other areas disturbed for the installation of the culvert.

**1.2 MEASUREMENT AND PAYMENT**

- .1 Measure the supply and installation of pipe culverts in linear metres in place and paid under bid items for each size of pipe "Pipe Culverts - 600mm C.S.P.", "Pipe Culverts - 700mm C.S.P.", "Pipe Culverts - 800mm C.S.P.", and "Pipe Culverts - 1200mm C.S.P.". Payment shall be full compensation for supplying all culvert pipe materials including couplers and appurtenances, dewatering, excavation, exposure and debris removal from existing culverts, preparing the culvert bed, granular bedding, installing the pipe, backfilling, supply and placement of geotextile and rip rap, and all labour, equipment, tools and incidentals necessary to complete the work to the satisfaction of the Departmental Representative.
- .2 Measure the removal of pipe culverts in linear metres in place and paid under bid item "Remove and Dispose C.S.P. Culverts". Payment shall be full compensation for removal and disposal of existing pipe materials, couplers and appurtenances and all labour, equipment, tools and incidentals necessary to complete the work to the satisfaction of the Departmental Representative.
- .3 Application of best management practices herein including watercourse isolation, diversion, as necessary, pumping, and fish capture is to be completed in a manner to minimize turbidity in the watercourse and shall be incidental to the installation of the culvert. No separate payment will be made.

**2. PRODUCTS**

**2.1 CORRUGATED STEEL PIPE (CSP)**

- .1 Culverts shall be corrugated steel pipe, manufactured in accordance with CAN3-G401 and will be zinc coated by a hot dip galvanizing process.
- .2 Minimum wall thickness to be 2.0 mm except for 1200mm diameter pipes where minimum wall thickness to be 2.8mm.
- .3 Corrugations to be 68 mm pitch x 13 mm depth.

- .4 The pipe sections will be connected with corrugated band couplings, also conforming to CAN3-G401.
- .5 2:1 mitred sloped end sections are required for each culvert. Sloped end sections to be factory cut and galvanized. No field cutting or trimming permitted.

## **2.2 CULVERT GRANULAR BEDDING**

- .1 Material for granular bedding shall be a mixture of clean sand and gravel, free from frozen clay lumps, cementation, organic material, or other deleterious materials. The granular bedding shall meet the gradation as outlined in the table below.

Sieve Size (mm)	Percent Passing (by weight)
40	100
25	90-100
20	20-55
12.5	0-10
10	0-3

## **2.3 CULVERT BACKFILL**

- .1 Common excavation material from site shall be used for culvert backfill.
- .2 Clay seal to be placed on both culvert ends for a length of 3 m. Select material will be sourced on-site as approved by Departmental Representative.

## **2.4 RIP RAP**

- .1 Rip Rap: in accordance with 31 37 00 – Rip Rap

## **2.5 GEOTEXTILE**

- .1 Geotextile: in accordance with 31 32 19.01 Geotextile

## **3. EXECUTION**

### **3.1 GENERAL**

- .1 All culverts shall be installed using best management practices for working in or near water that will result in a minimum amount of sedimentation and damage to the riparian area of the watercourse. The Contractor shall prepare a plan for the installation of each culvert, a minimum one (1) week prior to doing the work for approval by the Departmental Representative and ESO.
- .2 The culverts shall be installed using best management practices for placement, including consideration of aquatic ecology.
- .3 It is preferable to install the culvert during periods of low discharge (e.g. during the fall). The use of sediment control measures may be necessary to ensure that excessive amounts of sediments do not enter watercourses.

- .4 It may be necessary to exclude fish from the immediate construction site while the culvert is being installed. If this practice is necessary, fish shall be salvaged from within the exclusion area, and construction should be carried out expediently to minimize the time spent working in the drainage.

### **3.2 TRENCHING AND EXCAVATION**

- .1 Excavation for the culvert base shall be to a depth of not less than 0.3m below culvert invert and shall be a minimum of 3 times the culvert diameter in width.
- .2 Any soft and yielding or other unsuitable material below this level will be removed to the depth required by the Departmental Representative and backfilled with approved granular material compacted to a uniform density of 95% of Standard Proctor Density throughout the entire length of the culvert.
- .3 Obtain the Departmental Representative's approval of trench line and depth prior to placing bedding material or pipe.
- .4 In areas where the road is in service and no alternate route is available, construction staging and accommodations must be made to provide traffic passage at all times.

### **3.3 CULVERT BEDDING**

- .1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.
- .2 Place a minimum thickness of 300 mm of approved granular material on bottom of excavation. Place material in uniform layers not exceeding 150 mm thickness, and compact each layer to at least 95% Standard Proctor Density before placing succeeding layer.
- .3 Shape bedding to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by the Departmental Representative, free of sags or high points.
- .4 Place bedding in unfrozen condition.
- .5 Do not backfill until pipe grade and alignment are checked and accepted by the Departmental Representative.

### **3.4 LAYING CORRUGATED STEEL PIPE CULVERTS**

- .1 Begin placing pipe at downstream end.
- .2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.
- .3 Lay pipe with outside circumferential laps facing upstream and longitudinal laps or seams at side or quarter points.
- .4 Do not allow water to flow through pipes during installation except as permitted by the Departmental Representative.
- .5 Culverts are to be sloped to allow water to drain downstream and to prevent standing water upstream or inside the pipe.

### **3.5 JOINTS**

- .1 Match corrugations or indentations of coupler with pipe sections before tightening.
- .2 Tap couplers firmly as they are being tightened, to take up slack and ensure snug fit.
- .3 Insert and tighten bolts.

### **3.6 CULVERT BACKFILL**

- .1 Backfill around and over culverts as shown on Drawings or as directed by the Departmental Representative.
- .2 Place backfill material in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
- .3 Compact each layer within 2% optimum moisture content to 95% maximum dry density taking special care to obtain required density under haunches.
- .4 During construction protect installed culvert with minimum 500 mm cover of compacted fill before heavy equipment is permitted to cross. Width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 2:1. Remove temporary cover prior to finish gradeing.
- .5 Place backfill in unfrozen conditions.

**END OF SECTION**

**1. GENERAL**

**1.1 DESCRIPTION**

- .1 Supply and installation of the guardrail system including but not limited to guardrail, line posts, end treatments and guide post delineators.

**1.2 MEASUREMENT AND PAYMENT**

- .1 Measurement for supplying and installing guardrail system will be in linear metres and paid for under "W-Beam Guardrail". Payment made will be full compensation for supply of all labour, materials and equipment necessary to supply and install a fully functional guardrail system including but not limited to all guardrail materials, end treatments, reflectors and guide post delineators, to the satisfaction of the Departmental Representative.

**1.3 QUALITY ASSURANCE**

- .1 Upon request from Departmental Representative, submit manufacturer's test data.

**2. PRODUCTS**

**2.1 GENERAL**

- .1 All materials shall be in accordance with the following standards, specifications or publications:
  - .1 Canadian Standards Associations (CSA)
    - .1 CSA G40.20 and G40.21-M87 – Structural Quality Steels
    - .2 CSA G164-M – Hot Dip Galvanizing of Irregularly Shaped Articles
    - .3 CSA W59-M – Welded Steel Construction (Metal Arc Welding)
    - .4 CSA 080-M – Wood Preservation
  - .2 American Society for Testing and Materials (ASTM)
    - .1 ASTM A307 – Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
    - .2 ASTM D4956 – Retroreflective Sheeting for Traffic Control
    - .3 ASTM E316.3 – Magnetic gauge testing of galvanizing coating
  - .3 American Association of State Highway and Transportation Officials (AASHTO)
    - .1 AASHTO Standard Designation M-180 of the latest edition "Corrugated Sheet Steel Beams for Highway Guardrail"
    - .2 Task Force 13 report "A Guide to Standardized Highway Barrier Hardware"



- .4 American Road and Transportation Builders Association (ARTBA)
  - .1 ARTBA Technical Bulletin No. 268-B
- .5 National Lumber Grades Authority (NLGA)
  - .1 NLGA Standard Grading Rules for Canadian Lumber
- .2 Guardrail line posts shall be 1830 mm in length.
- .3 All rail, hardware, and posts to be supplied new in accordance with the Drawings.
- .4 Guardrail reflectors shall have minimum dimensions of 108 mm x 76 mm and reflective sheeting meeting requirements of ASTM D4956 for Type IX or XI, installed on both sides of the reflector and white in colour.
- .5 Guide post delineators shall be round with an outer diameter of 90mm and overall length of 1.67 m. White strip of reflective sheeting 100 mm x 330 mm shall be fastened onto the black portion of the post, meeting requirements as specified in ASTM D4956 for Type X sheeting with Class I pressure sensitive adhesive backing.

### **3. EXECUTION**

#### **3.1 GENERAL**

- .1 Guardrail and guide posts shall be accurately set to the required depth and alignment, in a manner resulting in a smooth continuous installation as shown on the Drawings.
- .2 Tolerance for plumb and grade of posts shall be 6 mm maximum.
- .3 Holes shall be excavated by auger. The diameter of the holes shall be sufficient size to allow for pneumatic tamping in layers not exceeding 150 mm.
- .4 Unsuitable material at the bottom of the holes excavated shall be replaced with granular material. Disposal of unsuitable material and/or granular material shall be at the Contractor's expense. Guardrail posts shall rest directly on solid ground.
- .5 Guardrail laps shall be in the direction of traffic flow. Bolts shall be tightened to a minimum torque of 100 N.m.

**END OF SECTION**