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Appendix A Figures and Photographs of Work Areas
Appendix B Environmental Assessment

# SECTION 01 11 00 SUMMARY OF WORK

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

Title and description of Work.

Contract method.

Work sequence.

Contractor use of premises.

Owner occupancy.

### 1.2 PRECEDENCE

.1 For Federal Government projects, General Conditions take precedence over technical specification sections.

### 1.3 RELATED SECTIONS

.1 Section 01 14 00 – Work Restrictions.

.2 Section 01 31 00 – Project Managing and Coordination.

.3 Section 01 33 00 - Submittal Procedures.

.4 Section 01 35 30 – Health and Safety Requirements.

.5 Section 01 35 43 – Environmental Procedures.

### 1.4 PROJECT LOCATION

.1 The project is primarily located along Johnston Canyon in Banff National Park, AB at various locations along the pedestrian trail to the Johnston Canyon Upper Falls.

**Johnston Canyon Locations:**

Refer to Figure 1 and the annotated photographs in Appendix A for the work site locations.

### 1.5 WORK COVERED BY CONTRACT DOCUMENTS

.1 In preparation for and during the Work at Johnston Canyon in Banff National Park, an Environmental Protection Plan (EPP) is to be prepared by the successful Contractor to meet the requirements of Section 01 35 43 – Environmental Procedures to ensure the desired minimal adverse effects are achieved. The Departmental Representative and Parks Canada's Environmental Surveillance Officer (ESO) will refer to the approved EPP in determining compliance with the plan and contract specifications. The EPP will form part of the contract.

.2 Without limiting the scope of work, the work under this Contract generally comprises the following:

.1 Rock Scaling, trimming, rock bolting, cold patching, rock fall mesh installation, erosion control matting installation, asphalt removal and installation, designated tree removal, retaining wall construction, supply and installation of metal railing and expanded metal mesh, temporary removal and replacement or relocation of metal railing, and other related works.

.2 Mobilization and Demobilization of all manpower, equipment, materials, and other resources necessary to execute the Work.

.3 Assess with the Departmental Representative the work to be done at each location.

.4 Manage the project in accordance with Section 01 31 00 – Project Managing and Coordination.

.5 Carry out the Work in the order of priority specified, or as determined by the Departmental Representative.

.6 Prepare and submit all required submittals in accordance with Section 01 33 00 - Submittal Procedures.

.7 Responsibility for all aspects of site safety in accordance with Section 01 35 30 – Health and Safety Requirements.

.8 Coordinate work with Parks Canada and other contractors who may be working in the project area.

## 1.6 CONTRACT METHOD

.1 Construct Work under combined price contract.

.2 Rates for provision of equipment and operators to carry out any additional works, or works not explicitly specified herein shall be in accordance with the most recent edition of the Alberta Roadbuilders and Heavy Construction Association Equipment Rental Rate Guide and will be all inclusive and fully operated. Hourly rental of equipment will be measured in actual working time and necessary travel time within project limits. Transportation time to and from site is to be reimbursed only if equipment is used exclusively for additional work.

## 1.7 ACTION REQUIRED BY CONTRACTOR

.1 The Contractor shall take whatever measures are necessary to protect all existing infrastructure including the surface of the Johnston Canyon Trail along the worksite.

.2 The contractor will undertake all necessary means to protect the catwalks and other permanent structures. Any damage will be at the Contractor's expense.

.3 The Contractor has checked or is familiar with the site and understands the extent and details of the work. A mandatory on-site meeting will be held with The Contractor and The Departmental Representative prior to the start of the Project.

## 1.8 WORK SEQUENCE

.1 Coordinate Progress Schedule to allow Departmental Representative unrestricted access to inspect all phases of the Work.

.2 Conduct the work in the priority order determined by the Departmental Representative, starting on September 6, 2016.

.3 Maintain fire and emergency access at all times.

.4 The completion date of all work in Banff National Park is October 28, 2016. The Contractor can perform work on the trail over the Thanksgiving Long Weekend.

.5 At each work site where there is a requirement for Trimming, priority shall be given to work directly associated with completing Trimming prior to rock bolting, general scaling and other work activities.

## 1.9 CONTRACTOR USE OF PREMISES

.1 The Contractor has unrestricted use of site, subject to Section 01 14 00 – Work Restrictions, from award of contract and approval of submissions, until the contract is completed.

.2 The Contractor shall coordinate use of premises with others under direction of the Departmental Representative.

.3 The Contractor is responsible for obtaining and paying for use of additional storage or work areas needed for operations under this Contract.

.4 The Contractor shall obtain a business license from the Banff National Park Administration Office prior to commencement of work on site. Details will be provided at start-up meeting.

.5 All Contractor's business and private vehicles are required to display a vehicle work pass from Parks Canada. These permits may be obtained free of charge from Parks Canada.

## 1.10 OWNER OCCUPANCY

.1 Owner will occupy premises during construction period to execute normal operations.

.2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

## 1.11 OWNER FURNISHED ITEMS

.1 Owner will not supply any labour, equipment, or material resources for this project other than the following;

.1 280 $m^2$ of Geobrugg Spider mesh

.2 Turnbuckles

.3 120 $m^2$ Geobrugg Greenax and MacMat mesh

.4 Rundlestone for new wall

## 1.12 CONSTRUCTION SIGNAGE

.1 No signs or advertisements, other than warning signs, are permitted on site.

.2 Maintain approved signs and notices in good condition for duration of project, and remove from site on completion of project or earlier if directed by the Departmental Representative.

.3 Signage shall be coordinated with other Contractors where necessary.

## 1.13 SETTING OUT OF WORK

.1 Departmental Representative will provide:

.1 Complete set of Photographs as part of this document.

.2 Measurements for Payment.

.2 Contractor shall:

.1 Allow sufficient time and facilitate site access for the Departmental Representative to inspect the work and take measurements for payment. Such inspection may include the use of the Contractors rope access equipment to facilitate locating the work and measurement for payment.

.2 Discuss and come to an agreement (sign off sheet required) with the Departmental Representative on measurement for payment at the end of each day or completion of work in an area, whichever is more frequent.

## 1.14 EXECUTION

.1 Disposal of Materials from Rock Slope Stabilization

.1 All materials from rock scaling, trimming and excavation of existing fallen material in ditches in work areas shall be diverted into Johnston Canyon.

.2 Trails and walkways in work sites shall be cleaned of blasted and scaled rock before pedestrians are permitted to pass through.

.3 No extra payment will be made for clean up of sidewalks along the work site following rock scaling, trimming, and all other project work as it will be considered incidental to project.

.2 Blasting

.1 The Departmental Representative must be provided with proposed blasting plans for review and must be notified as to where blasts are proposed. The Contractor shall be completely responsible for all liaison and coordination with respect to blasting.

.2 Notwithstanding the Departmental Representative's approval of blasting methods, the Contractor shall be completely responsible for any damage, which is a direct result of its blasting or other operations.

.3 Prior to blasting the Contractor with the Departmental Representative will jointly inspect the walkway, other infrastructure and other tangible assets (including but not limited to trees, and infrastructure associated with the trail). This record will be used as the basis to establish if damage has occurred as a result of blasting.

.4 Explosives shall be stored outside the Park in accordance with applicable regulations.

.3 Execution of Work

.1 The Contractor shall execute work in an efficient and expeditious manner. The Departmental Representative reserves the right to order the removal from the work site any employee of the Contractor who fails to work in an efficient and

expeditious manner. This may include but is not limited to the Project Superintendent. This shall be strictly enforced.

.2 The Departmental Representative reserves the right to order removal from work site, any piece of equipment that is not in good operating condition and the Contractor shall immediately rectify problem or replace faulty equipment with an equivalent unit within 48 hours.

.4 Crew Qualifications

.1 The Contractor must have a crew and supervisors experienced and qualified in rock scaling as specified, drilling and blasting, rock bolt installation, excavation and disposal of excavated material, and all other work identified herein.

.2 The Project Superintendent shall have extensive experience with rock stabilization projects involving scaling, bolting and trim blasting. The deputy Project Superintendent shall have substanial experience with rock stabilization projects involving scaling, bolting and trim blasting.

.5 Scope and Description of Specific Work Sites

.1 Work sites are illustrated and described in Appendix A included in the contract specifications.

.2 The quantities of work at different work sites indicated in Appendix A, and summarized in the Unit Price Table, are for estimating purposes only.

## PART 2 PRODUCTS

### 2.1 NOT USED

.1 Not used.

## PART 3 EXECUTION

### 3.1 NOT USED

.1 Not used.

**END OF SECTION**

# SECTION 01 14 00 WORK RESTRICTIONS

## PART 1 GENERAL

### 1.1 PRECEDENCE

.1 For Federal Government projects, General Conditions take precedence over technical specification.

### 1.2 RELATED SECTIONS

.1 Section 01 35 30 – Health and Safety Requirements.

.2 Section 01 35 43 - Environmental Procedures.

### 1.3 EXISTING SERVICES

.1 Provide for wildlife traffic through the work areas for the duration of the construction.

### 1.4 USE OF THE WORKSITE/LAYDOWN AREA

.1 Laydown area(s) will be allocated by Parks Canada and shall only be used for purposes of the Work. Laydown area(s) will be made available for the Contractors non-exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.

.2 Parks Canada Agency regulations prohibit anyone working within the Park from using public campground facilities.

.3 While the Work Site and laydown area are under the Contractor's control, the Contractor shall be entirely responsible for their security. The definition of the work site will be taken to mean any place or location the Contractor is working, has personnel (either working or on standby), or has equipment (being used or stored), or any location noted in the annotated photographs.

.4 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 for the performance and inspection of the Work.

.5 The Contractor shall provide and maintain a portable sanitary facility (toilet) at a location specified by the Departmental Representative, for use by the Contractor and Departmental Representative, in accordance with governing regulations and Environmental Procedures for this project.

.6 The facilities noted in .5 above shall be maintained at least once a week and consumables replenished as required.

.7 Any damage to the Work Site or adjacent pathways or other existing facilities caused by the Contractor shall be repaired by the Contractor at its own expense.

.8 The Contractor may work during daylight hours, seven (7) days per week from 06:00 hrs to 20:00 hrs with the following restrictions:

.1 Restricted hours for blasting – 07:00 hrs to 15:00 hrs seven days per week, except long weekends. Outside of these hours, blasting may be undertaken between 15:00 and 18:00 with the Departmental Representatives approval.

.2 There may be restrictions to accommodate special events with in the Park. Parks Canada will provide two weeks' notice of any upcoming restrictions.

### 1.5 WORK CONDUCTED OVER OR ADJACENT TO WATERWAYS

.1 All components of the Work shall be conducted in accordance with Section 01 35 43 - Environmental Procedures and the Environmental Protection Plan for the project.

.2 All components of the Work shall be conducted without equipment entering into wetlands, water bodies, streams and rivers, unless as directed by the Departmental Representative.

.3 All non-natural waste materials (i.e. scrap asphalt and pavement) from the Work shall be contained and collected in a manner to prevent any contact with the river valleys and waterways. Waste materials shall be disposed of in accordance with Section 01 35 43 - Environmental Procedures and the Environmental Protection Plan 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.

## 1.6 ACCESS TO ADJACENT PROPERTIES

.1 Construction operations shall be conducted so as to cause minimal inconvenience to the public and to owners of adjoining property. Existing access to property shall be maintained as far as possible and if new access must be provided, every effort shall be taken to provide the new access before the existing access is removed.

## 1.7 UTILITIES & EXISTING INFRASTRUCTURE

.1 The Contractor shall be responsible for locating any/all utilities in the Work Area and for any damage incurred to utilities in the Work Area while occupying site.

.2 The Contractor shall be responsible for moving signs, railings, and other infrastructure where feasible to do so, and otherwise protecting all existing infrastructure such as pavement surface, curb, sidewalks and culverts, in the work sites. The Contractor shall be responsible for repairing all damage which can reasonably be prevented.

.3 No separate payment will be made for aforementioned work. Costs of this work shall be considered incidental to contract.

## 1.8 PROTECTION OF PERSONS AND PROPERTY

.1 The Contractor shall comply with all applicable safety regulations of Work Safe Alberta including, but not limited to, the Worker's Compensation Act and the Occupational Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations.

.2 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Site in accordance with Section 01 35 30 – Health and Safety Requirements.

.3 The Contractor shall promptly repair, replace or compensate for any loss or damage caused by the Contractor to any property or, if Parks Canada so directs, shall promptly reimburse to Parks Canada the costs resulting from such loss or damage.

## 1.9 USE OF PUBLIC AREAS

.1 The Contractor shall ensure its vehicles and equipment do not cause nuisance in public areas. Vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud and dirt clinging to the vehicle body and wheels. All vehicles transporting materials to or from the Work Site shall be loaded in a manner that prevents dropping of materials or debris on the roadways. Where contents may be blown off during transit such loads shall be covered by tarpaulins or other suitable covers. Spills of materials in public areas shall be removed or cleaned immediately by the Contractor at no cost to the Owner. All activities shall be in accordance with Section 01 35 43 - Environmental Procedures and the Environmental Protection Plan for the project.

.2 All tracked equipment operating on paved roadways or trails shall be equipped with "Street Pads" to prevent damage to the road surface.

### 1.10 SUPERVISORY PERSONNEL

.1 Within five (5) days after award notification, the Contractor shall submit to the Departmental Representative confirmation of the names of the supervisory personnel and other key staff designated for assignment on the Contract.

.2 The following personnel shall be included in the list:

.1 Project Superintendent;

.2 Deputy Project Superintendent;

.3 Safety Representative; and

.4 ISA Certified Arborist.

.3 The above personnel shall perform the following duties:

.1 The Project Superintendent shall be employed full time and shall be present on the Work Site each and every workday that Work is being performed, from the commencement of Work to Total Performance of the Work.

.2 The Project Superintendent shall nominate a Deputy Project Superintendent who shall have the authority of the Project Superintendent during the latter's absence.

.3 The Safety Representative shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement of Work until the Total Performance of the Work.

.4 The Arborist shall prepare, review and/or certify the Designed Tree Removal plans, and vist the site as detailed in the specifications.

### 1.11 MEETINGS

.1 The Work includes attending meetings between the Contractor and the Departmental Representative. The meetings will be called and chaired by the Departmental Representative as required. The Contractor shall be represented at such meetings to the satisfaction of the Departmental Representative.

.2 The Departmental Representative will schedule a mandatory initial meeting to be held on site after award notification and prior to any work being carried out. Senior representatives of the Owner, Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.

.3 The Contractor shall assemble all its site staff for an initial environmental briefing to be conducted by Parks Canada Environmental Safety Officer at initial project start-up. The briefing shall be approximately 2 hours in duration and held at a time and place agreeable to the Departmental Representative and Contractor. Subsequent environmental briefings will be arranged for new staff arriving on the project.

.4 Cost of attending the above meetings and briefings shall be considered incidental to the Unit Price items and no additional payment will be made.

.5 The Arborist is required to attend the kick off meeting at the start of the project.

### 1.12 STORAGE OF EXPLOSIVES

.1 No site for storage of explosives products will be provided to the Contractor. It is the responsibility of the Contractor to store all explosives products outside of the Park.

## PART 2 PRODUCTS

### 2.1 NOT USED

Not Used.

## PART 3 EXECUTION

### 3.1 NOT USED

Not Used.

**END OF SECTION**

# SECTION 01 25 20 MOBILIZATION AND DEMOBILIZATION

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 Mobilization and Demobilization.

### 1.2 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work.

### 1.3 DESCRIPTION

.1 Consists of preparatory work and operations including but not limited to, those necessary for the movement of personnel, equipment, supplies, shops, offices and incidentals to and from the project sites.

### 1.4 MEASUREMENT PROCEDURES

.1 Payment shall be made under “Lump Sum Price Item – Mobilization/Demobilization”.

.2 50% of Lump Sum Contract Price for Mobilization and Demobilization to be paid when mobilization to site is complete.

.3 The remainder of Lump Sum Price for 2016 Mobilization and Demobilization to be paid when work is complete and all materials, equipment, camp, buildings, shops, offices and other facilities have been removed from site and site cleaned and left in a condition to the satisfaction of the Departmental Representative and all other Agencies having Jurisdiction.

.4 Payment of only 5% of the total price tendered will be scheduled as outlined above. If the amount bid for Mobilization and Demobilization is greater than 5% of the total price tendered, payment of the remainder of the amount will be authorized when contract has been completed.

## PART 2 PRODUCTS

### 2.1 NOT USED

Not Used.

## PART 3 EXECUTION

### 3.1 NOT USED

Not Used.

**END OF SECTION**

# SECTION 01 29 01 SITE OCCUPANCY

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 Definition of Site Occupancy

### 1.2 RELATED SECTIONS

.1 SACC R2850D GC 5.10

.2 Section 01 11 00 – Summary of Work

### 1.3 Definition of Occupancy

.1 OCCUPANCY – Contract Completion Date:

.1 Work must begin as set out in Section 01 11 00 Clause 1.8.2 due to public access limitations.

.2 Notwithstanding SACC R2850D – GC 5.10, the Contactor shall be permitted to lease and occupy sites where he will be working in Banff National Park, free of charge from contract award up to and including the Contract Completion date as set out in Section 01 11 00 Clause 1.8.4. The sites to be leased by the Contractor include areas specified in this contract and as directed by the Departmental Representative.

.3 If the Contractor has not completed the work identified in the contract by the Completion Date, to the satisfaction of the Departmental Representative, a site lease fee of $2,500.00 per calendar day shall be payable for each and every calendar day, commencing as per Section 01 11 00 Clause 1.8.4, and continuing until the Contractor has completed the work and is no longer occupying the site to a maximum of $15,000.00. No allowances shall be made for days of inclement weather, equipment breakdown or any reasons outside of the Contractor's control.

.4 If the Contractor has completed the work identified in the contract prior to the date set out in Section 01 11 00 Clause 1.8.4 to the satisfaction of the Departmental Representative, Parks Canada will pay the Contractor an amount equal to the site lease fee of $2,500.00 per calendar day multiplied by the number of days the Contractor has completed the work and is no longer occupying the sites. The maximum amount payable by Parks Canada to the Contractor shall be $15,000.00.

.5 The Contractor's occupancy of the site will be deemed to have ended when both of the following conditions are met to the satisfaction of Parks Canada:

.1 All work identified under this contract has been completed.

.2 All site cleanup including completed demobilization and any outstanding deficiencies have been addressed to the satisfaction of the Departmental Representative (at the sites located in this contract).

**END OF SECTION**

# SECTION 01 31 00 PROJECT MANAGING AND COORDINATION

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

Coordination of Work, progress meetings, schedules, submittals, and close out procedures.

### 1.2 RELATED SECTIONS

.1 Section 01 11 10 - Summary of Work.

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 01 35 43 - Environmental Procedures.

.4 Section 01 52 00 - Construction Facilities.

### 1.3 COORDINATION

.1 Coordinate progress schedules, submittals, use of site, temporary utilities, construction facilities, construction Work, and Work by others, under instructions of the Departmental Representative.

.2 The Contractor shall coordinate with other contractors working on the site to develop a work schedule agreeable to all parties to carry out the work without interruption.

### 1.4 MEASUREMENT

.1 All Project Management is considered incidental to the Contract, and will not be measured for payment.

### 1.5 CONSTRUCTION ORGANIZATION AND START-UP

.1 Within seven (7) days after award of Contract, a start-up meeting is required to discuss administrative procedures and responsibilities.

.2 Senior representatives of the Owner, Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to attend the start-up meeting. Meeting is to be in Banff National Park (time and location to be determined).

.3 The Contactor’s Arborist shall attend the startup meeting. At this meeting, the location of Designated Tree Removal shall be reviewed.

.4 Start-up meeting agenda to include following:

.1 Appointment of official representatives of participants in Work.

.2 Schedule of Work and progress scheduling in accordance with Section 01 31 00 Part 1.6.

.3 Requirements for temporary facilities, offices, storage sheds, utilities, fences in accordance with Section 01 52 00.

.4 Site safety and security in accordance with Section 01 35 30.

.5 Proposed changes, change orders, approvals required, mark-up percentages, time extensions, and other administrative requirements and procedures.

.6 Monthly progress claims, photographs, and holdbacks.

.7 Insurances, blasting licenses, and transcript of policies.

.5 Comply with the Departmental Representative's allocation of laydown areas on site for field offices and sheds, for access, traffic, parking, sanitary facilities, and use of temporary utilities and construction facilities.

.6 Coordinate intra-project communications including submittals, reports and records, schedules, coordination of Drawings, recommendations, and resolution of ambiguities and conflicts through the Departmental Representative.

.7 Coordinate with the Departmental Representative to review and layout the proposed work at each site prior to the start of work at that site.

## 1.6 ON-SITE DOCUMENTS

.1 Maintain at job site, one copy each of the following:

.1 Contract Drawings, Specifications, and Addenda.

.2 Change Orders.

.3 Other modifications to Contract.

.4 Safety Plan.

.5 WHMIS documentation and all Health and Safety records.

.6 Environmental Protection Plan.

.7 Field test reports.

.8 Proposed and As-built Blasting Plans for each blast.

.9 Copy of approved Work Schedule.

.10 Labour conditions and wage schedules.

.11 Applicable current editions of municipal regulations and by-laws.

## 1.7 SCHEDULES

.1 Submit preliminary construction progress schedule to the Departmental Representative coordinated with Owner's project schedule.

.2 After review, revise and resubmit schedule to comply with revised project schedule.

.3 Periodically revise and resubmit schedule as directed by the Departmental Representative.

## 1.8 CONSTRUCTION PROGRESS MEETINGS

.1 Meetings are to be held on a weekly basis or more frequently as required.

## 1.9 SUBMITTALS

.1 Submit requests for payment for review and transmittal to the Departmental Representative.

.2 Submit requests for interpretation of Contract Documents, and obtain instructions through the Departmental Representative.

.3 Process change orders through the Departmental Representative.

.4 Deliver closeout submittals for review and preliminary inspections, for transmittal to the Departmental Representative.

### 1.10 CLOSEOUT PROCEDURES

.1 Notify the Departmental Representative when Work is considered ready for Substantial Completion Inspection.

.2 Accompany the Departmental Representative on preliminary inspection to determine items listed for completion or correction.

.3 Comply with the Departmental Representative's instructions for correction of items of Work listed in executed certificate of Substantial Completion.

## PART 2 PRODUCTS

### 2.1 NOT USED

Not Used.

## PART 3 EXECUTION

### 3.1 NOT USED

Not Used.

**END OF SECTION**

# SECTION 01 33 00 SUBMITTAL PROCEDURES

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 Shop Drawings and product data.

.2 Certificates and transcripts.

.3 Required Contractor Submittals

.1 Pre-mobilization Submittals

.1 Schedule
.2 Contractor Chain of Command
.3 Work Plan
.4 Construction Access Plan
.5 Environmental Protection Plan (EPP)
.6 Blasting Safety Plan
.7 Emergency Response Protocol
.8 Blasting Plans
.9 Health and Safety Plan
.10 Rock Bolt Installation Procedure

.2 Construction Phase Submittals

.1 Proposed Blast Designs
.2 Proposed Designated Tree Removal plans certified by the ISA Arborist.
.3 Rock Bolt Installation Records
.4 Monthly Progress Reports including revised Project Schedule
.5 Daily Quantity Sheets
.6 Pre-Construction Condition Surveys
.7 Work site Health and Safety Inspection Report

.3 Project Completion Submittals

.1 Record digital Photographs (CD not prints)
.2 As-Built Blasting Records

### 1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.3 RELATED SECTIONS

.1 Section 01 14 00 – Work Restrictions.

.2 Section 01 35 30 – Health and Safety Requirements.

.3 Section 01 35 43 – Environmental Procedures.

.4 Section 01 78 00 - Closeout Submittals.

### 1.4 REFERENCES

.1 Not used.

## 1.5 ADMINISTRATIVE

.1 Provide submittals to the Departmental Representative for review with reasonable promptness so as not to delay the Work. Failure to provide submittals in a timely manner is not considered sufficient reason for an extension of Contract Time.

.2 Work affected by a submittal shall not proceed until review is complete.

.3 Where information is not produced in SI Metric units, the Contractor is required to convert the united in to metric.

.4 Review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

.5 Notify the Departmental Representative, in writing at time of submission, identifying any deviations from requirements of the Contract Documents stating reasons for deviations.

.6 Verify that field measurements and affected adjacent Work are coordinated.

.7 The Contractor's responsibility for errors and omissions in submissions is not relieved by the Departmental Representative’s review of submittals.

.8 The Contractor's responsibility for deviations in submissions from requirements of the Contract Documents is not relieved by the Departmental Representative’s review.

.9 Keep one reviewed copy of each submission on site.

## 1.6 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit manufacturer’s data sheets for all explosives, rock bolts, railings, and all other products to be incorporated into the Work prior to their use in the Work.

## 1.7 SAMPLES

.1 Not used.

## 1.8 MOCK-UPS

.1 Not used.

## 1.9 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers’ Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

## 1.10 REQUIRED CONTRACTOR SUBMITTALS

.1 General

.1 This Clause identifies the plans, programs, and documentation required prior to mobilization to site, during the construction phase, and upon project completion.

.2 The Contractor shall not construe the Departmental Representative’s review and authorization of the submittals to imply approval of any particular method or sequence for conducting the Work. Authorization of the programs shall not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal or Provincial regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by

the project. The Contractor shall remain solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

.2 Pre-Mobilization Submittals

.1 Submit the following plans and programs to the Departmental Representative for review a minimum of five (5) business days prior to mobilization to the project site. The Contractor shall not begin any site Work until the Departmental Representative has authorized acceptance of the submittals in writing.

.1 Project Schedule detailing milestone dates, schedule of workdays, and manpower required to complete each project activity will be submitted.

.2 Contractor Chain of Command, listing the key Contractor personnel, names and positions, addresses, telephone, email addresses, cellular telephone and/or pager numbers. The list shall include contact persons who are available on a 24-hour basis in the event of emergencies.

.3 Work Plan, describing the Contractor's intended methods of construction including but not limited to the environmental mitigation strategies and projected number of personnel on site.

.4 Construction Access Plan, which shall include, but not be limited to, procedures for accessing all areas of the Work.

.5 Environmental Protection Plan (EPP), which shall meet the requirements of Section 01 35 43 - Environmental Procedures.

.6 Blasting Safety Plan, describing special procedures to be followed during rock blasting to ensure protection of the public and workers in accordance with Section 01 35 30 – Health and Safety Requirements.

.7 Emergency Response Protocol detailing the Contractor's procedures for management of emergency situations and providing a response plan, protocols, and contact information.

.8 General Blasting Plan for the work which outlines the proposed types of explosives, delays and detonators, and provide details for drilling, loading, and blasting. Handling and storage practices for explosives products shall be described in detail.

.9 Occupational Health And Safety Program - The Contractor shall have a Certificate of Recognition (COR) or Registered Safety Plan (RSP) including a site specific Health and Safety Plan acceptable to the Departmental Representative. The Contractor shall implement and maintain the Health and Safety Plan during the Work.

.12 Rock Bolt Installation Procedure in accordance with Section 31 23 23 – Rock Bolts.

.3 Construction Phase Submittals

.1 Proposed Blast Designs.

.1 Not less than two (2) days prior to commencing work at each trimming location, submit a Proposed Blast Design for that trim location to the Departmental Representative for review in accordance with Section 31 23 21 – Trimming.

.2 Rock Bolt Installation Record in accordance with Section 31 23 23 – Rock Bolts.

.3 Monthly Progress Report updates, including an updated schedule.

.4 Daily Quantity Sheet. The Contractor is required to submit a daily quantity sheet for the work.

.5 Pre-Construction Condition Survey. The Contractor shall submit a survey of the pre-existing conditions at each work site prior to undertaking scaling, trimming, or other work that could damage existing infrastructure. The Pre-Construction Condition Survey shall be in a format acceptable to the Departmental Representative and include digital photos, measurements, and written descriptions as appropriate to document the existing conditions.

.6 Proposed Designated Tree Removal work plan, submitted not less than two (2) days prior to commencing work at each Designated Tree. Work plan should included but not limited to method for protecting infrastructure, method of directing falled tree, and work procedure.

.7 Work Site Health and Safety Inspection Report (weekly) – Submit weekly in accordance with Section 01 35 30 – Health and Safety Requirements.

.4 Project Completion Submittals

.1 Record Digital Photographs -The Contractor shall submit copies of all Contractor's Digital Photographs (by electronic copy not prints).

.2 As-Built Blasting Record - The Contractor shall submit an As-Built Blasting Record for each blast.

## PART 2 PRODUCTS

### 2.1 NOT USED

Not Used.

## PART 3 EXECUTION

### 3.1 NOT USED

Not Used.

**END OF SECTION**

# SECTION 01 35 30 HEALTH AND SAFETY REQUIREMENTS

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 Health and safety considerations required to ensure that PCA shows due diligence towards health and safety on construction sites, and meets the requirements laid out in PCA/RPB Departmental Policy DP 073 - Occupational Health and Safety - Construction.

### 1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.3 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 43 - Environmental Procedures.

### 1.4 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.3 Province of Alberta

.1 Workers Compensation Act.

.2 Occupational Health and Safety Regulations.

### 1.5 SUBMITTALS

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

.2 Submit a site-specific Health and Safety Plan at least five (5) days prior to mobilization to site. Health and Safety Plan must include:

.1 Identification of applicable compliance obligations.

.2 Definition of responsibilities for project safety/organization chart for project.

.3 General safety rules for project.

.4 Job specific safe work procedures.

.5 Inspection policy and procedures.

.6 Incident reporting and investigation policy and procedures.

.7 Occupational Health and Safety meetings.

.8 Occupational Health and Safety communications and record keeping procedures.

.9 Results of site specific safety hazard assessment.

.10 Results of safety and health risk or hazard analysis for site tasks and operation.

.3 Submit two (2) copies of a weekly Work Site Health and Safety Inspection Report prepared by the Contractor's authorized Safety Representative to the Departmental Representative and authority having jurisdiction, on a weekly basis.

.4 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit copies of Material Safety Data Sheets (MSDS) to the Departmental Representative.

.7 The Departmental Representative will review the Contractor's site-specific Health and Safety Plan and provide comments to the Contractor within seven (7) days after receipt of plan. Revise plan as appropriate and resubmit plan to the Departmental Representative within five (5) days after receipt of comments from the Departmental Representative.

.8 The Departmental Representative's review of the Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: Where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to the Departmental Representative.

.10 On-site Contingency and Emergency Response Plan to address standard operating procedures to be implemented during emergency situations.

## 1.6 FILING OF NOTICE

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

## 1.7 SAFETY ASSESSMENT

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

## 1.8 MEETINGS

.1 Schedule and administer Health and Safety meeting with the Departmental Representative prior to commencement of Work.

## 1.9 REGULATORY REQUIREMENTS

.1 Carry out Work in accordance with National Parks Act.

## 1.10 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with Work Safe Alberta.

## 1.11 GENERAL REQUIREMENTS

.1 Develop a written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. The Health and Safety Plan must address project specifications.

.2 The Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

## 1.12 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

## 1.13 COMPLIANCE REQUIREMENTS

.1 Comply with the Workers Compensation Act and Occupational Health and Safety Regulations of Alberta.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

## 1.14 UNFORESEEN HAZARDS

.1 When unforeseen or peculiar safety-related factors, hazards, or conditions occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise the Departmental Representative verbally and in writing.

## 1.15 HEALTH AND SAFETY REPRESENTATIVE

.1 Employ and assign to the Work, a competent and authorized Health and Safety Representative. The Health and Safety Representative must:

.1 Have substanial site-related working experience specific to activities associated with rock slopes.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor’s Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of Work and report directly to and be under direction of Site Supervisor.

## 1.16 POSTING OF DOCUMENTS

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

## 1.17 CORRECTION OF NON-COMPLIANCE

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

.2 Provide the Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 The Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

.4 In the event that work is temporarily stopped either by the Departmental Represented, or by a body having jurisdiction, it will not relieve the Contractor of his responsibilities under this Contract. Standby time and all costs associated with a stop work order due to safety considerations, is considered incidental to the contract.

## 1.18 BLASTING

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

.2 Blasting is to be in accordance with Section 01 35 43 - Environmental Procedures.

### 1.19 POWDER ACTUATED DEVICES

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

### 1.20 WORK STOPPAGE

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

## PART 2 PRODUCTS

### 2.1 NOT USED

Not used.

## PART 3 EXECUTION

### 3.1 NOT USED

Not used.

**END OF SECTION**

# SECTION 01 35 43 ENVIRONMENTAL PROCEDURES

## PART 1 GENERAL

### 1.1 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.2 MEASUREMENT PROCEDURES

.1 Preparation and implementation of an Environmental Protection Plan in accordance with this Section 01 35 43 – Environmental Procedures will not be measured separately for payment and will be considered incidental to the work.

### 1.3 SUBMITTALS

.1 The Contractor is required to prepare an Environmental Protection Plan (EPP) in accordance with this Section 01 35 43 – Environmental Procedures.

### 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 Banff Parks Canada Administration Office, prior to commencement of the contract.

.3 All Contractors' vehicles are required to display a vehicle work pass from Parks Canada. These permits may be obtained free of charge from Parks Canada.

### 1.5 CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)

.1 Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA) Guidelines Order of 2003 and subsequent amendments.

.2 Failure to comply with or observe environmental protection measures identified in these specifications may result suspension of the work pending rectification of the problems.

### 1.6 START-UP AND ENVIRONMENTAL BRIEFING

.1 All staff employed at the construction site will be subject to a briefing regarding their individual and collective responsibilities to ensure avoidable adverse environmental impact does not arise from their activities and personal choices. Employees must attend this briefing, lasting approximately 2 hours, before beginning their work at the site. Each employee, having received the briefing, will be issued a certification sticker to be displayed on his or her helmet. It is recognized new employees may join the Contractors' work force after the initial round of "environmental briefing". In that case and as required, subsequent "environmental briefings" can be presented as numbers warrant, by arrangement with the ESO (Environmental Safety Officer) through the Departmental Representative. Also, some sub-trades may be present at the site for a short time, to perform once-only duties. In these cases, the "environmental briefing" will be replaced by the Contractor explaining the environmental sensitivity of the work location to the sub-trade worker(s), and reviewing highlights of personal conduct expected, with reference to a one-page briefing summary to be provided to the Contractor by the ESO. A copy of this summary will be provided to each sub-trade worker joining the work force.

.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.

## 1.7 CONSTRUCTION SITE ACCESS AND PARKING

.1 The Contractor shall review both short and long term construction access requirements with the Departmental Representative, both at start-up and on an ongoing basis. In consultation with the Departmental Representative, the Contractor shall formulate an agreement for worker transportation to and from the work sites and where workers shall park their private vehicles. Generally, personal vehicles shall be parked at least 10 metres distance from any watercourse.

## 1.8 PROTECTION OF WORK LIMITS

.1 The EPP shall include details of how the Contractor shall mark work limits and procedures that shall be employed to ensure trespass outside these limits does not occur, to the satisfaction of the Departmental Representative and the ESO. The Contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by workers' vehicles or construction machinery and shall instruct workers so that the "footprint" of the project is kept within defined boundaries

## 1.9 EROSION CONTROL

.1 Sediment and 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.

.2 On-site sediment control measures shall be constructed and functional prior to initiating activities that may generate sediment or deleterious runoff. The EPP shall include an Erosion Control Plan to the satisfaction of the Departmental Representative and ESO.

.3 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. The Departmental Representative and ESO also will monitor erosion control performance.

.4 The site shall be secured against erosion during periods of construction inactivity.

## 1.10 POLLUTION CONTROL

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

.2 A Spill Response Plan shall be prepared as part of the EPP and shall detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products, to the satisfaction of the Departmental Representative and the ESO and in accordance with all applicable federal and provincial legislation. The EPP shall include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement, sand blasting agents, and petroleum based products.

.3 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any

hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation. Hazardous products shall be stored no closer than 100 metres from any rivers and their tributaries.

.4 An impervious berm shall be constructed around fuel tanks and any other potential spill area. The berm shall be capable of holding 110% of the tank storage volume and shall be to the satisfaction of the Departmental Representative and the ESO before start-up. Measures such as collection/drip trays and berms lined with occlusive material such as plastic and a layer of sand, and double-lined fuel tanks can prevent spills into the environment.

.5 The Contractor shall prevent blowing dust and debris by covering and/or providing dust control by methods approved by the Departmental Representative or ESO.

.6 The Contractor shall provide spill kits at re-fuelling, lubrication, and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order at all times. The ESO and Departmental Representative prior to project start-up must approve these spill kits. The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in their use.

.7 Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The Departmental Representative and the ESO shall be notified immediately of any spill. If not available, Banff Dispatch shall be immediately contacted at 403-762-4506. Spill response cards will be distributed during the initial Environmental Briefing with basic instructions and phone numbers.

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

9. The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions) shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Departmental Representative and ESO.

## 1.11 EQUIPMENT MAINTENANCE, FUELLING AND OPERATION

.1 The Contractor shall ensure that all soil, seeds and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) outside of the National Park before delivery to the work site.

.2 Equipment fuelling sites will be identified by the Contractor and approved by the Departmental Representative and the ESO. Except for chain saws, any fuelling closer than 100 metres to any streams, wetlands, water bodies or waterways shall require the authorization and oversight of the Departmental Representative.

.3 Diesel and gasoline delivery vehicles, including bulk tankers shall be parked more than 100 metres from any streams, wetlands, water bodies or watercourses. Gravity fed fuel systems are not allowed. Manual or electric pump delivery systems shall be used. Fuelling personnel shall maintain presence at and immediate attention to fuelling operations.

.4 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times.

.5 Equipment used on the project shall be fuelled with E10, and low sulphur diesel fuels and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of vehicles is avoided.

.6 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the ESO or the Departmental Representative. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste

petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. anywhere within a National Park.

.7 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order.

.8 Fuel containers, lubricant products, or other potentially deleterious substances shall be stored only in secure locations specified by the Departmental Representative and be secured to ensure they are tamperproof and cannot be drained by vandals. Alternatively, the Contractor may hire security personnel to prevent vandalism.

## 1.12 OPERATION OF EQUIPMENT

.1 Equipment 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 shall enter, work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities.

.2 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.

.3 Restrict vehicle movements to work limits.

## 1.13 FIRE PREVENTION AND CONTROL

.1 A fire extinguisher shall be carried and available for use on each machine and gasoline powered equipment.

.2 Construction equipment shall be operated in a manner and with all original manufacturer's safety devices to prevent ignition of flammable materials in the area.

.3 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented. Smoking or other activities with the potential to cause a fire may be restricted and/or prohibited in some of the work areas at the discretion of the ESO and the Departmental Representative depending on the current fire hazard rating.

.4 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The ESO and the Departmental Representative shall be notified of any fire immediately. If not available, Banff Dispatch shall immediately be contacted at 403-762-4506 and 911 (emergencies).

.5 Fires or burning of waste materials is not permitted.

## 1.14 WILDLIFE

.1 During the Environmental Briefing all personnel shall be instructed by the ESO on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns.

.2 If necessary, schedule construction activities around important wildlife windows.

.3 Avoid or terminate activities on site that attract or disturb wildlife and vacate the area and stay away from the immediate location if bears, cougars, wolves, elk or moose display aggressive behavior or persistent intrusion. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) shall be exercised at all times.

.4 Notify the ESO and Departmental Representative immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the site or crew accommodation. Other wildlife-related encounters are to be reported within 24 hours. If the ESO or Departmental Representative is not available, Banff Dispatch shall be contacted at 403-762-4506.

## 1.15 RELICS, FOSSILS AND ANTIQUITIES

.1 Artifacts, relics, fossils, antiquities and items of historical interest such as cornerstones, commemorative plaques, inscribed tablets and similar objects found on the work site shall be reported to the ESO or the Departmental Representative immediately. The Contractor and workers shall wait for instructions before proceeding with their work.

.2 All historical or archaeological objects found in Banff National Park are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found and request direction from the ESO or the Departmental Representative.

## 1.16 WASTE MATERIALS STORAGE AND REMOVAL

.1 The Contractor shall dispose of hazardous wastes in conformance with the Environmental Contaminants Act, applicable provincial regulations, and the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.

.2 All wastes originating from construction, trade, hazardous and domestic sources, shall be kept separate for disposal in separate waste streams where available or required.

.3 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere within National Parks. These wastes shall be contained and removed in a timely and approved manner by the Contractor and workers, and disposed of at an appropriate waste landfill and recycling site(s) located outside the park. Construction waste storage containers, provided by the Contractor, shall be emptied by the Contractor when 90% full. Waste containers shall have lids, and waste loads shall be covered while being transported.

.4 A concerted effort shall be made by the Contractor and workers to reduce, reuse and recycle materials.

.5 All efforts to prevent wildlife from obtaining food, garbage or other domestic wastes shall be made by the Contractor and contract staff while undertaking work in National Parks. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily removal from the National Park and off site disposal of food scraps, food wrappers, beverage containers, domestic waste, and other potential wildlife attractants is mandatory. Existing Parks Canada waste receptacles shall not be used for disposal of such wastes without prior arrangement with Parks Canada.

.6 The Contractor and workers shall immediately report any circumstances related to food/garbage and wildlife to the ESO or the Departmental Representative. If neither can be reached, the Contractor/worker shall immediately contact Banff Dispatch at 403-762-4506.

.7 Sanitary facilities, such as a portable container toilet, shall be provided and maintained in a clean condition by the Contractor, as directed by the Departmental Representative.

## 1.17 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES

.1 The National Park Act regulations prohibit anyone working within National Parks from using public campground facilities.

.2 Removal and storage of snow shall be the Contractors responsibility and arranged with the ESO and the Departmental Representative.

.3 The Contractor shall control blowing dust and debris generated from the construction site by means such as covering or wetting down dry materials and rubbish. Dust control measures for temporary access roads may also have to be initiated.

.4 Security services at the work site may be desirable or necessary during the contract, especially during quiet times. Fuel tanks or other potentially deleterious substances shall be secured to ensure they are tamperproof and cannot be drained by vandals.

.5 Pets shall not be brought to or maintained at the construction site.

## PART 2 PRODUCTS

### 2.1 NOT USED

Not Used.

## PART 3 EXECUTION

### 3.1 CLEARING AND GRUBBING

Not Used

### 3.2 SPECIFIC CONCERNS RELATIVE TO BLASTING AND SCALING

.1 Wildlife are present in Banff National Park. Prior to blasting and periodically during scaling, the Contractor shall “sweep” the work area and maintain a continuous watch for wildlife that may be present. If wildlife are present, work shall be halted until the wildlife have passed through the area and/or have been hazed out of the area by the ESO or a Park Warden.

.2 The Contractor shall ensure that all work activities meet or exceed the standards outlined in DFO’s “Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters”; Canadian Technical Report of Fisheries and Aquatic Sciences 2107, 1998.

.3 Steps shall be taken to minimize fly-rock and dust. Vegetation outside of the designated area shall not be damaged or destroyed.

.4 The Contractor shall describe the proposed type and quantities of explosives to be used to the satisfaction of the Departmental Representative and ESO. Blasting products that may produce high residual nitrogen concentrations (such as ANFO) will not be permitted.

### 3.3 SPECIFIC CONCERNS RELATIVE TO EXCAVATING AND PLACEMENT

.1 Materials shall be placed at storage sites or on the grade without spillage outside the working limits. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that location. 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.

.2 All sediment control measures shall be implemented by the Contractor prior to the commencement of the work in the vicinity of water bodies, watercourses, and wetlands.

.3 Special precautions must have to be taken during excavation in the vicinity of intermittent or active drainage channels. See “Specific Concerns”.

.4 Fisheries protection windows shall be observed for any watercourse in this contract and will guide the timing of the work so that stream disturbance is prevented.

.5 If a pump-out sump to dewater excavation sites will be required, the Contractor is to prepare an EPP which details how the dewatering shall be undertaken, to the satisfaction of the Departmental Representative and the ESO. Special attention is to be given to the environmental sensitivity of the discharge area, freezing conditions operation, and overflow avoidance, decanting and settlement pond reclamation. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the Departmental Representative and the ESO.

## 3.4 SPECIFIC CONCERNS RELATIVE TO EROSION CONTROL AND SEDIMENTATION

.1 The EPP shall include an Erosion and Sedimentation Management Plan for the components of this contract that are undertaken in proximity to watercourses, wetlands or riparian environments. This plan shall be to the satisfaction of the Departmental Representative and ESO. If sediment ponds are required, they shall be designed to settle all sediment particles 0.02 mm or larger. The ponds shall also be designed to handle 1:5 year storm events, with overflow spill capacity for 1:10 year storm events and emergency spillway capacity for 1:100 year storm events.

.2 An important desired end result is to allow no release into watercourses of sediments in levels that are deleterious to fish or that would harmfully alter, disrupt, or destroy fish habitat. Similarly there is to be no sediment release into areas of vegetation growth or sensitive areas of sediments in levels that would adversely alter growing or hydraulic conditions. The target is 0 mg/L of TSS over background levels. The threshold is a maximum instantaneous increase of 25 mg/L over background levels when background levels are <250 mg/L, or a maximum instantaneous increase of 10% over background levels when background levels are >250 mg/L. This threshold shall not be exceeded.

**END OF SECTION**

# SECTION 01 52 00 CONSTRUCTION FACILITIES

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Project identification.

.5 Resident Departmental Representative facilities requirements.

### 1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.3 INSTALLATION AND REMOVAL

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such facilities after use.

### 1.4 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load any part of the Work with a weight or force that will endanger the Work.

### 1.5 CONSTRUCTION PARKING

.1 Provide and maintain adequate access and parking at the project site in areas approved by the Departmental Representative.

.2 Build and maintain temporary roads and provide snow removal during period of Work.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

### 1.6 SECURITY

.1 If required by the Contractor, the Contractor shall provide and pay for security personnel to guard the work, work site, and contents of site after working hours, during holidays, and during extended shutdowns. The Contractor is advised that some random acts of vandalism to equipment have occurred within the Park.

### 1.7 OFFICES

.1 No site office is required to be provided for the Departmental Representative.

.2 Provide a clearly marked and fully stocked first aid case in a readily available location.

### 1.8 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities and to minimise aesthetic impacts.

### 1.9 SANITARY FACILITIES

.1 The Contractor shall provide and maintain a portable sanitary facility (toilet) at a location specified by the Departmental Representative, for use by the Contractor and Departmental Representative.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

### 1.10 CONSTRUCTION SIGNAGE

.1 No other signs or advertisements, other than warning signs, are permitted on site.

.2 Signs and notices for safety and instruction shall be in both official languages. Graphic symbols shall conform to CAN3-Z321.

.3 Maintain approved signs and notices in good condition for duration of project, and remove from site upon completion, or earlier if directed by the Departmental Representative.

## PART 2 PRODUCTS

### 2.1 NOT USED

Not Used.

## PART 3 EXECUTION

### 3.1 NOT USED

Not Used.

**END OF SECTION**

# SECTION 01 56 00 TEMPORARY BARRIERS AND ENCLOSURES

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 Barriers.

.2 Environmental Controls.

.3 Traffic Controls.

### 1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.3 RELATED SECTIONS

.1 Section 01 52 00 - Construction Facilities.

### 1.4 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

### 1.5 HOARDING

.1 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

### 1.6 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guardrails and barricades around deep excavations.

### 1.7 WEATHER ENCLOSURES

.1 Not used.

### 1.8 DUST TIGHT SCREENS

.1 Not used.

### 1.9 ACCESS TO SITE

.1 Provide and maintain access roads, as may be required for access to Work.

### 1.10 PUBLIC TRAFFIC FLOW

.1 Provide and maintain 4 barriers with signs at the trail head. Provide one diversion sign with instructions for people coming from Paint Pots Trail.

.2 Provide and maintain competent TCPs, traffic signals, barricades and signs as required to perform Work and protect the public.

### 1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding public property from damage during performance of Work.

.2 Be responsible for damage incurred.

### 1.12 PROTECTION OF BUILDING FINISHES

.1 The Contractor is advised that concrete curbs and sidewalks, light fixtures, architectural stone faced walls, and other infrastructure are present in some of the work areas and shall be protected against damage due to the Work.

## PART 2 PRODUCTS

### 2.1 NOT USED

.1 Not Used.

## PART 3 EXECUTION

### 3.1 NOT USED

.1 Not Used.

**END OF SECTION**

# SECTION 01 74 11 CLEANING

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

### 1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.3 RELATED SECTION

.1 Section 01 35 43 - Environmental Procedures.

.2 Section 01 77 00 - Closeout Procedures.

### 1.4 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by the Owner, the Public, or other Contractors.

.2 Trails and sidewalks in work areas shall be thoroughly cleaned to remove all loose soil and rock material at the end of each work day.

.3 Remove waste materials from site at regularly scheduled times or dispose of as directed by the Departmental Representative. Do not burn waste materials on site.

.4 Clear snow and ice from access to work areas during active construction periods and to maintain access to environmental protection facilities outside active construction times.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.6 Provide on-site bear proof containers for collection of waste materials and debris.

.7 Remove waste material and debris from site at end of each working day.

.8 Dispose of waste materials and debris off site.

.9 Store volatile waste in covered metal containers, and remove from premises at end of each work day.

.10 Provide adequate ventilation during use of volatile or noxious substances.

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

### 1.5 FINAL CLEANING

.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Prior to final review, remove surplus products, tools, construction machinery and equipment.

.3 Remove waste products and debris including that caused by Owner or other Contractors.

.4 Remove waste materials from site at regularly scheduled times or dispose of as directed by the Departmental Representative. Do not burn waste materials on site.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.6 Inspect finishes, and ensure specified workmanship and operation.

.7 Remove dirt and other disfiguration from exterior surfaces.

.8 Sweep and wash clean paved areas.

.9 Clean drainage systems.

## PART 2 PRODUCTS

### 2.1 NOT USED

.1 Not Used.

## PART 3 EXECUTION

### 3.1 NOT USED

.1 Not Used.

**END OF SECTION**

# SECTION 01 77 00 CLOSEOUT PROCEDURES

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 Administrative procedures preceding preliminary and final inspections of Work.

### 1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.3 RELATED SECTIONS

.1 Section 01 74 11 - Cleaning.

.2 Section 01 78 00 - Closeout Submittals.

### 1.4 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify the Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request Departmental Representative's Inspection.

.2 Departmental Representative's Inspection: The Departmental Representative and the Contractor will perform inspection of Work to identify obvious defects or deficiencies. The Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that the following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Work is complete and ready for Final Inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by the Departmental Representative, and Contractor. If Work is deemed incomplete by the Departmental Representative, complete outstanding items and request re-inspection.

**PART 2 PRODUCTS**

**2.1 NOT USED**

Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

Not Used.

**END OF SECTION**

# SECTION 01 78 00 CLOSEOUT SUBMITTALS

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

.1 As-built records.

.2 Warranties and bonds.

### 1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.3 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 77 00 – Closeout Procedures.

### 1.4 AS-BUILTS AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:

.1 Contract.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the Contract.

.5 Inspection certificates.

.2 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.

.3 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.4 Keep record documents and samples available for inspection by Departmental Representative.

### 1.5 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of Drawings and site photos are required.

.2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.3 Specifications: legibly mark each item to record actual construction, including:

.1 Changes made by Addenda and change orders.

### 1.6 WARRANTIES AND BONDS

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

.4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

## PART 2 PRODUCTS

### 2.1 NOT USED

.1 Not Used.

## PART 3 EXECUTION

### 3.1 NOT USED

.1 Not Used.

**END OF SECTION**

# SECTION 31 23 20 ROCK SCALING

## PART 1 GENERAL

### 1.1 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.2 RELATED SECTIONS

.1 Section 31 23 21 – Trimming (Rock Excavation).

### 1.3 DEFINITIONS

.1 Scaling: Scaling consists of the removal of loose soil, rock, and overburden from up to 5 m behind the crest of the slope, the slope face, and benches on the slope. Scaling shall be done by hand working from a fall restraint or work positioning system and using suitable hand tools and powered equipment. Scaling also includes felling and removal of trees and brush, and pulling down larger rocks with wire rope attached to equipment on the trail.

### 1.4 MEASUREMENT PROCEDURES

.1 Scaling will be measured as the hours of time spent by each ***individual*** scaler actively working on the slope, beginning at the top of rope decent to the scaling area, and ending at the time the scaler reaches the bottom of that particular rope decent. Time spent accessing scaling areas, maintaining equipment, or carrying out work using tools or methods which are not the most appropriate or best suited to a particular situation will not be measured for payment.

.2 Payment for Scaling will be made at the Contract Unit Price per hour for Scaling, which shall be full compensation for supplying all material, labour and equipment to execute the work as specified, including timber and brush disposal, and other overhead costs.

.3 Temporary removal and replacement of railings from work areas are at the Contractor's expense.

.4 Protection of infrastructure shall be considered incidental to scaling and all other unit price work items. Clean up and removal of scaled material is incidental to scaling.

.5 Repair or replacement of all infrastructure damaged by scaling operations, to the satisfaction of the Departmental Representative, shall be at the Contractors cost.

.6 Payment for Designated Tree Removal will be made at the Contract unit rate for Designated Tree Removal, which shall include the preparation of the work plan for each tree to be removed and all worked associated with the removal.

## PART 2 PRODUCTS

### 2.1 NOT USED

.1 Not Used

## PART 3 EXECUTION

### 3.1 SUBMITTALS

.1 Pre-Construction Condition Survey: The Contractor shall submit to the Departmental Representative, not less than one day before the commencement of Work at each work area, a Pre-Construction Condition Survey of all infrastructure in the work area that may

be subject to damage as a result of the work. The format of the survey shall be acceptable to the Departmental Representative.

.2 Prior to the commencement of Scaling, the Contractor shall provide the Departmental Representative with a Work Plan/Procedure which details measures the Contractor shall implement to protect any existing utilities and infrastructure which may be impacted by scaling or other construction activities.

.3 Prior to the commencement of any Designated Tree Removal, the Contractor shall provide the Departmental Representative with a Work Plan/Procedure which details measures the Contractor shall implement to ensure the designed final resting position of the tree and protection measures for any existing infrastructure which may be impacted by Designated Tree Removal activities.

## 3.2 REQUIREMENTS

.1 The Contractor shall provide an experienced scaling crew that consists of a supervising scaling foreman with extensive experience and a minimum of five (5) rock scalers of which a minimum of four (4) rock scalers must have substantial experience scaling and working from ropes at heights. The scaling crew shall not have more than one inexperienced rock scaler at any time. The scaling crew size shall be maintained at all times until the completion of all work above the trail grade.

.2 Where scaling activities may impact upon any existing infrastructure the Contractor shall provide protective measures as detailed in the Contractor's Work Plan/Procedure, prior to commencing scaling. Protective measures shall include but not be limited to; padding material placed on the trail, blasting mats, temporary rock berms or barriers, and temporary removal of signs, railings and similar infrastructure. The Contractor shall be completely responsible for all damage that is a result of its scaling or other operations.

.3 The Contractor shall have scaling bars, mattocks / pulaskis, shovels, hydraulic jacks or wedge jacks, compressed air “blow pipes”, air bags, chainsaws, wire rope for pulling down large rock using a front end loader, and other hand tools and equipment available on site such that scaling can be carried out using the most appropriate and effective tools and methods for any given situation.

.4 The scaling foreman and at least one other scaler on the slope shall have a 2-way radio for communication with supervisory personnel along the trail.

.5 Designated Tree Removal shall be undertaken by a ISA certified Arborist or under the direct supervision of a certified Arborist by a certified faller.

## 3.3 EXECUTION

.1 For each slope section, scale areas shown on the photographs and as directed by the Departmental Representative.

.2 Trees and brush shall only be removed as directed and approved by the Departmental Representative.

.3 Scaling shall be carried out using the most appropriate and effective tools and methods for any given situation as directed by the Departmental Representative.

.4 Any construction access on the slope including but not limited to trail building, installing access ropes, ladders, and tree and brush removal to facilitate access to the designated scaling areas shall be considered incidental to work and all shall be removed upon completion of the work.

.5 All rope work shall comply with best practices detailed in the Alberta Construction Safety Network scaling operations guidelines and applicable Work Safe Alberta regulations.

**END OF SECTION**

# SECTION 31 23 21 TRIMMING (ROCK EXCAVATION)

## PART 1 GENERAL

### 1.1 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.2 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Procedures.

Section 31 23 20 – Rock Scaling.

### 1.3 DEFINITIONS

.1 Trimming consists of rock excavation to remove unstable rock masses on a slope that are too large or solid to remove by scaling, rock excavation to improve slope and ditch geometry, and breaking up rock boulders larger than 1.5 $m^3$ in volume from sources other than Trimming to facilitate loading to trucks for off-site disposal. Frozen soils are not classified as rock.

.2 Trimming will also consists of breaking up of boulders on the slope located at Station 0+512 to 0+545. Trimming will be used to reduce the volume of individual rocks released from the slope.

.3 Trimming shall utilize high explosives and shall not exceed 50 cubic metres bank volume per blast unless otherwise approved by the Departmental Representative.

.4 Limits of Excavation: Surfaces forming the required extent of excavation by Trimming as shown on the photographs or as directed by the Departmental Representative.

.5 Controlled Blasting: The use of blasting methods designed to prevent rock damage or overbreak beyond the Limits of Excavation, provide adequate fragmentation, and prevent damage to infrastructure from vibrations, fly rock, or falling rock. Unless otherwise authorized by the Departmental Representative, Controlled Blasting requires that:

.1 Blast holes shall not exceed 8 m depth.

.2 The spacing of blast holes situated along the backline or Limit of Excavation shall not exceed 0.75 m.

.3 “Buffer Blasting” shall be used with appropriate delays between successive rows of blast holes where there are more than two rows of holes.

## 1.4 MEASUREMENT PROCEDURES

.1 Trimming will be measured as the in-situ “bank” volume of rock excavated, based on measurements agreed upon by the Departmental Representative and the Contractor before and after each trim. Over excavation and over break beyond the Limits of Excavation, and secondary breaking of oversize material resulting from Trimming will not be measured for payment.

.2 Payment for Trimming will be made at the Contract Unit Price per cubic metre of rock trimmed. The tendered unit price shall be full compensation for supplying all material, labour and equipment to execute the work as specified.

.3 Payment for Trimming will not be made until all related submittals have been received and approved by the Departmental Representative.

.4 During the kick off meeting the trim location at Station 0+512 to 0+545 and the location below Catwalk 6 will be reviewed.

.5 Rock Scaling to facilitate access to trim locations and performance of Trimming, and Scaling of the trim area and the slope below the trim area to remove all loose rock produced by Trimming shall be incidental to Trimming.

.6 Preparation of submittals, engaging a Blast Consultant, and Proposed Blasting Plans are considered incidental to Trimming.

.7 Protection of infrastructure and removal of trimmed material from the trail is considered incidental to Trimming.

.8 If the Contractor fails to follow the Blast Design and the slope remains in an undesirable condition following Trimming, all remedial measures necessitated by improper blasting as determined by the Departmental Representative shall be at the Contractors expense.

.9 The as-built blast report comprises 5% of the total value of the trim.

## PART 2 PRODUCTS

### 2.1 TYPES OF EXPLOSIVES AND ACCESSORIES

.1 Bulk ammonium nitrate and fuel oil (ANFO) type explosives shall not be used.

.2 Where there is a danger of initiation system cut-offs, detonators and delay elements must be of a type that includes down-hole delays (e.g. Handidet) to prevent cut-offs.

.3 Non-explosive rock excavation products shall be produced by a recognized manufacturer.

.4 Det cord over 20 Grain shall not be used on the surface without prior written consent from the Departmental Representative.

## PART 3 EXECUTION

### 3.1 SUBMITTALS

.1 Pre-Construction Condition Survey: The Contractor shall submit to the Departmental Representative, not less than two (2) days before Trimming, a Pre-Construction Condition Survey of all infrastructure in the area that might be subject to damage. The format of the survey shall be acceptable to the Departmental Representative.

.2 Proposed Blast Design: Not less than two (2) days prior to commencing work for each trim location, submit a Proposed Blast Design for that trim location to the Departmental Representative for review. The Proposed Blast Design shall be in a format acceptable to the Departmental Representative and include as a minimum the following information:

.1 Site location of Trimming.

.2 Methodology for Trimming.

.3 Plan and cross section sketch drawings of proposed trim showing the free face, drill pattern (burden and spacing), dimensions, and estimated volume, calculations for maximum charge weight per delay.

.4 Diameter, inclination, orientation, depth, and number of drilled holes.

.5 Loading diagram showing type and amount of high explosive or non-explosive products, initiators, and depth of stemming for each type of blast hole.

.6 Initiation sequence for blast holes including delay pattern and delay times.

.7 Manufacturer’s data sheets for all explosive and non-explosive products, delays and initiation systems to be used.

.8 Make and model of non-explosive rock excavation equipment (e.g. hydraulic splitters, excavator mounted Hydraulic Breaker, etc.).

.9 Methods of protecting existing infrastructure that shall be employed.

.3 As-Built Blasting Record: Not more than one (1) working day after completing work at each trim location, submit an As-built Blasting Record to the Departmental Representative. The As-built Blasting Record shall indicate all deviations from the Proposed Blast Design, the actual date, time, and duration of Trimming, and identify any known or suspected damage, or other problems which may have resulted from Trimming.

.4 Blasting plan submittals are for quality assurance and record keeping purposes. Review of the Proposed Blast Designs by Departmental Representative shall not relieve Contractor from responsibility for accuracy and adequacy of the designs when implemented.

## 3.2 QUALITY CONTROL

.1 Proposed Blast Designs for Trimming shall be prepared by the licensed Blaster who will directly oversee the Trimming.

.2 The Blaster shall be licensed with Work Safe Alberta, and shall have designed and carried out trim blasts for at least four (4) similar projects in the last five (5) years.

.3 The Blaster shall directly oversee the drilling, loading, and detonation of all blasts.

.4 The Contractor shall not commence drilling or other work on a trim blast until the Blast Design has been submitted to and reviewed by the Departmental Representative.

.5 The Contractor shall provide at least four (4) hours between the completion of drilling and start of loading to permit the Departmental Representative to measure the length of holes, dimensions of the blast, and perform other quality assurance tasks.

## 3.3 GENERAL REQUIREMENTS

.1 The Contractor shall provide suitable equipment to remove all drill hole traces in trim areas.

.2 The Contractor shall provide blasting mats and all other supplies, labour, and equipment necessary to control fly rock and protect existing infrastructure during the work.

.3 The contractor shall obtain all necessary permits from, and shall comply fully with the laws, rules and regulations of Municipal, Provincial and Federal agencies in connection with the use, transport, storage and safe handling of all explosives. The contractor shall be familiar with the Industrial Health and Safety regulations published by the Worker's Compensation Board of the Province in which the site is located.

.4 Explosives and all detonating apparatus shall be stored in a magazine in accordance with the requirements of all Federal or Provincial inspectors having jurisdiction, and the requirements of the Explosives Act (Canada), R.S. 1985, as amended, and any applicable Municipal By-laws.

.5 Blasting shall only be conducted after the Departmental Representative has received the Certificates of Insurance required by the Contract Documents. The Certificates shall verify that the Blaster’s General Liability and Property Damage Coverage contain no specific exclusions for Work related to Blasting.

.6 The Blaster shall bear full responsibility for ensuring that all Blasting Operations are conducted in a satisfactory manner and in accordance with these specifications. The Departmental Representative’s review of the Blasting Plan shall in no way relieve the Blaster from this obligation, nor shall the Departmental Representative assume any responsibility for the adequacy of the Blasting to achieve adequate breakage or acceptable results.

## 3.4 ENVIRONMENTAL REQUIREMENTS

.1 Use pneumatic chippers and/or an excavator mounted hydraulic rock breaker to remove all drill hole traces in the final excavation surfaces produced by trimming to the satisfaction of the Departmental representative and ESO (Environmental Surveillance Officer). Removal of drill hole traces shall be incidental to Trimming.

.2 Dispose of waste materials as specified in Section 01 35 43 - Environmental Procedures.

## 3.5 TRIM BLAST EXECUTION GENERAL

.1 Trimming shall be performed prior to other specified work such as scaling or rock bolting where this work may be adversely impacted by Trimming.

.2 Supply, place and remove protective measures for trail and all other infrastructure that might be damaged by Trimming. Protective measures shall include but not be limited to; granular padding material to protect trail/roadways, timbers or blasting mats to prevent flyrock or protect structures, and temporary removal of infrastructure at risk. The Contractor shall repair or replace any and all damage caused by Trimming at its own cost.

.3 Trimming shall be scheduled and coordinated with all stakeholders including but not limited to Parks Canada, the Departmental Representative, utilities, and local businesses in compliance with blasting related provisions of the specifications.

.4 Following Trimming, the slope shall be scaled to provide a sound rock surface in the trim area and to remove all loose rock and debris caused by Trimming.

.5 Where possible contamination of excavated rock with organic material shall be minimized.

**END OF SECTION**

# SECTION 31 23 23 ROCK BOLTS

## PART 1 GENERAL

### 1.1 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.2 RELATED SECTIONS

.1 Section 31 23 20 – Rock Scaling.

.2 Section 31 23 21 – Trimming (Rock Excavation).

### 1.3 GENERAL

.1 Rock Bolts consist of the installation of deformed steel bars in holes drilled into rock. Rock Bolts shall be fully grouted and either tensioned or untensioned as directed by the Departmental Representative.

.2 Numerous existing rock bolts have been installed at most of the work sites. Most of these bolts are camouflaged and not visible without close on-slope inspection. Therefore, the requirements for rock bolting can not be determined in advance of construction and the photographs indicate estimated rock bolting allowances only.

.3 The required number, length, location, and orientation of Rock Bolts will be determined on site by the Departmental Representative. The Contractor shall be prepared to install any number of rock bolts ranging up to 9 m in length at any or all of the work sites.

.4 Reserve Supply: The Contractor shall maintain on site a Reserve Supply of rock bolt accessories and grout such that there are no delays for procurement of materials.

### 1.4 MEASUREMENT PROCEDURES

.1 Supply of Rock Bolt Bars will be measured for payment as the length in meters of Rock Bolt Bar supplied to site and installed. The quantity of Rock Bolts delivered to site shall not exceed the tender amount. If required, additional Rock Bolts will be authorized by the Departmental Representative.

.2 Installation of Rock Bolts shall include the supply of bearing plates, nuts, hardened flat washers, beveled washers, centralizers, couplers, grout, resin, recessing of plates, mortar and the drilling, installation and testing of the rock bolts. Installation of Rock Bolts will be measured as the length in meters of Rock Bolt successfully installed and embedded into rock. Excessive bar protruding from the rock face shall not be measured.

.3 Payment for Rock Bolts will be at the Contract Unit Prices for Installation. Payment will not be authorized until all related submittals have been received and approved by the Departmental Representative.

.4 The Contract Unit Prices for rock bolts shall be considered full compensation for all rock bolt requirements in the specification. Scaling to facilitate access to the designated rock bolt areas is considered incidental to the work.

.5 The Contract Lump Sum Price for Rock Fall Mesh (Geobrugg Spider Netting) Installation shall be considered full compensation for all rock bolts, proprietary hardware, 100 m steel wire rope, and labour required for the installation. Parks Canada will provide the rock fall mesh. The installation of the mesh shall include 15 – 4 m long rock bolts cement grouted into 50 mm to 76 mm diameter boreholes. Extra lengths or numbers of bolts will be paid under the Rock Bolt Unit Rate.

.6 The Contract Lump Sum Price for Erosion Control Matting (Greenax and Macmat) Installation shall be considered full compensation for all rock bolts, hardware and labour required for the installation. Parks Canada will provide the erosion control matting. The installation of the Greenax and Macmat shall include 12 – 3.2 m long rock bolt cement grouted into 50 mm to 76 mm diameter boreholes. Extra lengths or numbers of bolts will be paid under the Rock Bolt Unit Rate.

## PART 2 PRODUCTS

### 2.1 MATERIALS

.1 The Contractor will supply all Rock Bolts for the proposed work. The supplied Rock Bolts shall be 25 mm diameter, Grade 517/690 MPa deformed steel bars conforming to CAN/CSA G30.18, such as “Dywidag Threadbar” manufactured by Dywidag Canada Limited, or approved equal.

.2 Steel bearing plates shall conform to CAN/CSA-G40.21, Grade 300 W and have minimum dimensions of 10 mm by 150 mm by 150 mm. Plates shall be of “calotte” or similar style to accommodate non-perpendicular alignment of the bolt with the plate. Propirary places shall be supplied by Geobrugg for use on the Spider Mesh

.3 Nuts shall be hexagonal head, heavy duty type, with hemispherical end matching the bearing plate. Where required for cable installation, nuts shall be cast hot dip galvanized eye nuts. All nuts used shall conform to ASTM A325. Threads and nuts shall be capable of developing the full strength of the bolt.

.4 Rock Bolts and all associated hardware shall be hot-dip galvanized to CSA G164 & CSA G30.18M. Field cut rock bolt bar shall be touched up with “Galvanox” zinc-rich paint or approved alternate by the Departmental Representative.

.5 Resin grout or cementitious grout may be used. Resin grout shall not be used where the rock is excessively fractured or wet, as determined by the Departmental Representative.

.6 Resin Grout shall be the product of an established manufacturer who has been producing these products for at least five (5) years. Resin shall be supplied in cartridge form and have a shelf life of not less than six (6) months, as dated on the container, and be used within the first three (3) months of the shelf life. Cartridges shall be stored in accordance with the manufacturer’s recommendations. Resin used for the anchorage length of the bolt shall have a gel set time of one (1) to two (2) minutes. Resin used to encapsulate the remainder of the bolt length shall have a gel time of fifteen (15) to thirty (30) minutes.

.7 Cement grout shall be a pre-bagged, non-shrink cementitious product such as “Microsil® Anchor Grout” produced by Basalite Concrete Products or approved equal. Cement grout shall have a minimum three (3) day and twenty-eight (28) day compressive strengths of 30 MPa and 50 MPa respectively when tested in accordance with CAN/CSA A23.2-1B. Equipment for mixing and pumping grout shall be capable of satisfactorily mixing and agitating the grout, and pumping it into the holes at the water/cement ratio recommended by the grout manufacturer. Grouting shall be tremied from the base of the hole to rock face. Cementaceous grouts and mortar shall not be warmer than 30$^{o}$C or colder than 5$^{o}$C during mixing or pumping.

.8 Cement mortar shall be SIKA 212 or similar product mixed, placed and cured in accordance with the manufactures recommendations.

.9 Cable used for the installation of rock fall mesh and erosion control matting shall be 19 mm (3/4 inch) – 6X19 steel core galvanized rope.

.10 For the area of rock fall mesh installation, Parks Canada shall provide Geobrugg spiral rope net Spider® S4 - 230 as well as turnbuckles for use on the cable system to the parking lot.

.11 For the area of erosion control matting, Parks Canada shall provide Geobrugg Greenax and MacMat netting to the Parking Lot.

## PART 3 EXECUTION

### 3.1 SUBMITTALS

.1 Rock Bolt Installation Procedure: Prior to ordering Rock Bolt materials, the Contractor shall submit a Rock Bolt Installation Procedure for review by the Departmental Representative. The Installation Procedure shall include product information from the bolt hardware and grout manufacturers including their recommended installation procedures, drilling equipment and hole diameter, grouting and tensioning procedures, calibration certificate(s) for rock bolt testing equipment, and similar information.

.2 Rock Bolt Installation Records: The Contractor shall submit to the Departmental Representative on a daily basis in a format approved by the Departmental Representative.

.3 Drillers Logs, including but not limited to details of flush losses/reductions, inferred faults, depth of overburden, hole diameter, rig type, type of flush, water ingress, jamming during drilling, changes in rock type and other relevant information that may affect the quality of the rock bolt installation. Logs shall be submitted to Departmental Representative within one (1) day after drilling or on request.

.4 Grout testing results, including but not limited to Compressive Strength testing, temperature, viscosity and unit weight.

.5 Rock Bolt Installation records, these shall include but shall not be limited to, individual bolt reference number, bar length, bar grade/diameter, depth of anchor distal end, proximal extension from face, proximal bar extension behind nut, over-drill depth, grout/resin type, grout/resin temperature, grout volume used, resin capsules used, number of spacers used, grout samples taken, spin time in resin, lock off load/tension, date/time tested, as constructed bolt azimuth, dates/time of staged grouting, date/time completed,

.6 Mill and galvanizing certificates for the Rock Bolt bar and other hardware.

### 3.2 QUALITY CONTROL

.1 Drill holes for, and install Rock Bolts under the direct supervision of an individual having extensive experience in the installation of resin and cement grouted bolts.

.2 The first ten (10) rock bolts shall be installed in the presence of the Departmental Representative.

.3 Hydraulic jacks, gauges and torque wrenches used for testing and tensioning of rock bolts shall be calibrated by an independent, certified testing laboratory.

.4 Provide the Departmental Representative with any samples of grouting materials that may be requested for quality assurance testing.

### 3.3 PROCEDURES

.1 Drill holes for each bolt to a uniform diameter recommended by the resin and bolt manufacturers to ensure bolt holes are completely filled with resin. In the case of cement grouted bolts, drill holes to a minimum diameter of 60 mm, or smaller if required to accommodate an expansion shell anchor. Completely clean holes of all drill cuttings, sludge, debris and water using clean water and air.

.2 Rock Bolts shall either be installed with an exposed plate and nut, or with the bolt cut off flush to the rock surface without plate and nut, or plate may be counter sunk into a recess in the rock face as directed by the Departmental Representative.

.3 Rock Bolts shall be installed with sufficient thread exposed to accept a plate and nut (if required) and to facilitate tensioning and testing. Where a plate and nut is not required, bolts shall be cut off flush with the rock surface after tensioning and testing, and be covered with mortar coated with drill cuttings. Burlap shall be placed over all mortar to aid curing.

.4 Rock Bolts for the installation of erosion control matting shall be drilled a minimum of one (1) metre into bedrock or as instructed by the Departmental Representative.

.5 Installation – Resin Grouted Rock Bolts

Insert resin cartridges in the hole. The number of cartridges per hole shall be not less than recommended by the manufacturer for the hole length, diameter, and bar size combination. Add additional cartridges as necessary to ensure holes are completely filled with resin. Use at least three (3) fast setting cartridges at the bottom of the hole for anchorage and slow setting cartridges for the remainder of the hole. Mix the resin by inserting the bolt in the hole and rotating it at a uniform penetration rate, rotation rate and duration as recommended by the resin manufacturer. After allowing the fast setting cartridges to set, but at least 10 minutes prior to the gel time of the slower cartridges, perform testing and tensioning, and attach the bearing plate and nut (if required).

.6 Installation – Cement Grouted Rock Bolts

Cement grouted bolts that are to be tensioned shall use either resin cartridges or an expansion shell for the bond length anchorage. Use commercially manufactured centralizers at intervals not greater than 2 m to keep the bar centered in the hole. Fill the holes with grout by pumping the grout through a delivery line that extends to the lowest end of the hole, while providing a means of venting at the highest end of the hole. Prior to the grout setting, perform testing and tensioning, and attach the bearing plate and nut (if required).

.7 Remove all excess or spilt resin and cement grout from rock surfaces.

.8 Testing

.9 Testing equipment shall consist of a suitably sized hollow core jack, an adjustable bearing truss for aligning the direction of pull with the centreline of the bolt, an extension bar for attaching the jack to the bolt, a hydraulic pump with a gauge, calibration chart for the ram/gauge combination that provides the applied load directly in kilonewtons, and an independently mounted dial gauge for measuring the strain of the bolt under load. Rock bolts will be selected at random by the Departmental Representative for testing by the Contractor. The first eight (8) of each type installed shall be tested; thereafter, 20% of the rock bolts shall be tested. Bolts shall be either Proof Tested or Pull Tested as directed by the Departmental Representative. Additional tests shall be performed where different rock types or bolt installation conditions are encountered as construction progresses.

.1 Proof Tests: After grout within the free stressing length of the anchor has cured, the anchor shall be pull tested by loading the anchor in tension to 184 kN and maintaining the load for ten (10) minutes. Anchors will be considered to have failed using the following criteria; if the creep is greater than 1 mm the test shall be extended to 60 minutes and the total creep movement shall be less than 2 mm measured between 6 minutes and 60 minutes or if movement continues to occur at or below the test load. Cement grouted anchors shall not be pull tested until at least seven (7) days after grouting.

.2 Pull Tests: Prior to grouting the free stressing length of the anchor curing, the bond length of the anchor shall be proof tested by loading the anchor in tension to 184 kN and maintaining the load for five (5) minutes. Anchors will be considered to have failed, and shall be replaced, if load at the end of the test falls beneath 175 kN or if movement continues to occur at or below the test load.

.3 Up to five (5) additional bolts in the vicinity of a failed bolt shall be tested as required by the Departmental Representative.

.10 Tensioning

.1 The Departmental Representative will determine the tension load for each rock bolt. Tensioning equipment shall consist of the hollow core jack. A calibrated impact or torque wrench may be used for light tension loads, subject to approval by the Departmental Representative. Tensioned Rock Bolts shall be tensioned before the grout within the free stressing length of the rock bolt cures. Bolts shall be tensioned and locked-off at tensions ranging from 50 kN to 158 kN as directed by the Departmental Representative.

.2 Untensioned bolts with a bond length anchorage shall be nominally tensioned to 25 kN using an approved impact or torque wrench. Where a bearing plate and nut is not required, these shall be removed and the protruding length of bolt cut off after the grout in the free stressing length has cured. In the case of untensioned, cement grouted bolts with a plate and nut, they shall be nominally tensioned to 25 kN after the grout in the free stressing length has cured.

**END OF SECTION**

# SECTION 05 52 00 HAND RAILING

## PART 1 GENERAL

### 1.1 RELATED REQUIREMENTS

.1 Section 01 35 43 - Environmental Procedures.

.2 Section 31 23 20 – Rock Scaling.

.3 Section 31 23 21 – Trimming (Rock Excavation).

### 1.2 SCOPE OF WORK

.1 Remove and reinstall the existing railing to facilitate rock scaling work.

.2 Modify the existing railing as indicated to provide an overall height of 1070mm and to facilitate the installation of mesh infill panels with a maximum bottom opening of 100mm.

### 1.3 PRICE AND PAYMENT PROCEDURES

.1 Measure Railing Modifications (including supply of new rails, posts, fasteners and mesh infill panels) in lineal meters.

.2 Measure Removable Post Splices in units.

.3 Measure Coating Touch-ups of previously installed railing as a Lump Sum.

### 1.4 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A307-14, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod

.2 ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.

.2 CSA International

.1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA S16, Design of Steel Structures.

.3 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.

.4 CSA W59-03(R2008), Welded Steel Construction, (Metal Arc Welding).

### 1.5 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:

.1 Convene pre-installation meeting one week prior to beginning work of this Section, with Departmental Representative in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.2 Prior to start of Work arrange for site visit with Departmental Representative to examine existing site conditions adjacent to rock scaling work.

.3 Hold project meetings every month.

.4 Ensure key personnel attend.

## 1.6 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's data sheets for structural steel and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings.

.2 Indicate shop and erection details including shop splices, cuts, copes, connections, holes, bearing plates, threaded fasteners, rivets and welds. Indicate welds by CSA W59, welding symbols.

.3 Proposed welding procedures to be stamped and approved by Canadian Welding Bureau.

## 1.7 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Protect powdercoated steel, before erection.

## 1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Storage and Handling Requirements:

.1 Protect coated steel prior to erection

.2 Replace defective or damaged materials with new.

# PART 2 PRODUCTS

## 2.1 MATERIALS

.1 Structural steel: to CSA G40.20/G40.21, grade and types as indicated

.1 Powdercoat all new railing components to the same shade of green as installed in 2015.

.2 Bolts, nuts and washers: as indicated.

## 2.2 SOURCE QUALITY CONTROL

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

# PART 3 EXECUTION

## 3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for installation.

.1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

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

## 3.2 PREPARATION

.1 Clean steel surfaces as directed by Departmental Representative when staining or defacing occurs.

## 3.3 INSTALLATION

.1 Do welding in accordance with CSA W59, except where specified otherwise.

.2 Finish: members true to line, free from twists, bends, open joints, sharp corners and sharp edges.

.3 Field splices: as exiting or as approved by Departmental Representative.

## 3.4 CLEANING

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

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for recycling.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

# SECTION 32 12 00 COLD PATCHING

## PART 1 GENERAL

.1 Freeze/thaw has affected the asphalt and paving along pedestrian trails which has resulted in numerous tripping hazards. Cold patching at various locations along the trail is intended to remove the tripping hazards.

### 1.1 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.2 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Procedures.

### 1.3 SCOPE OF WORK

.1 Clean existing pavement thoroughly using pressure washer or compressed air hose. Install cold patches asphalt mix in locations identified by the Departmental Representative.

### 1.4 MEASUREMENT AND PAYMENT

.1 Cold patch asphalt mix installation will be measured for payment per square meter of cold patch installed. The removal and disposal of existing asphalt material, cleaning, tack coat application and post installation cleaning are considered incidental to the costs.

## PART 2 PRODUCTS

### 2.1 MATERIALS

.1 The cold patch asphalt mix should consist of a high quality, pre-mixed, asphalt "cold patch" compound purchased from a local retailer.

.2 A tack coat shall be used for all patching work along the trail. The tack coat shall be any product that meets the requirements of Alberta Transportation Standard Specifications for Highway Construction or Departmental Representative approved equivalent.

.3 A copy of the manufacturer’s product specification shall be submitted to the Department Representative at least 7 days prior to delivery of the mix

## PART 3 EXECUTION

### 3.1 DESCRIPTION OF THE PROCEDURE OF THE WORK

.1 Suitable method, equipment, and hand tools shall be used to place and compact the cold patch asphalt mix.

.2 Mark areas with flagging or caution tape so the cold patch asphalt mix repair locations are not disturbed until it has cured.

.3 The surface on which the patching material is placed shall be free of dirt, sand, foreign matter, and loose material where identified by the Departmental Representative.

.4 At the time of use, stockpiled patching material shall exhibit uniform coating, good cohesion and workability, and be in accordance with the material specification requirements.

.5 SS-1 tack coat shall be applied to the area to be patched as per manufactures specifications.

.6 Place and compact the cold patch asphalt accordingly, ensuring the temperature is in accordance with the product instructions.

.7 The Contractor shall ensure proper adhesion of the mixture placed during the patching operation to the adjacent surfaces.

.8 For repairs exceeding 50 mm in depth, the patching material shall be placed in lift thicknesses of maximum 50 mm in depth and each lift shall be compacted prior to the addition of the next lift.

.9 After placement and final compaction of the patching material, patches shall be free of defective areas, including, but not limited to wheel track marking, ravelling, uneven surface, and fat spots.

.10 Allow cold patch asphalt mix to set prior to removing preventative measures.

.11 Dispose of any spilt or remaining cold patching asphalt mix materials outside the Park.

.12 Acceptance of all patching work shall be based on visual observation of the patching material, surface appearance of the patch at the time of patching, continuity with adjacent surfaces, and conformance of the patching materials to the requirements of this specification.

**END OF SECTION**

# SECTION 04 05 12 MASONRY AND MORTAR GROUT

## PART 1 GENERAL

### 1.1 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

### 1.2 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Procedures.

.2 Section 31 23 20 – Rock Scaling.

.3 Section 31 23 23 – Rock Bolting

### 1.2 DESCRIPTION

.1 The work shall include the supply and installation of the following:

.1 Two Rundlestone walls of 18m and 20m length respectively, with movements joints at 10 metres maximum including sealant and caulking.

.2 The stone masonry units to be supplied by the Owner

.3 Cutting and removal of existing asphalt and trenching for concrete placement.

.4 Drilling and grouting of deformed steel reinforcing dowels into rock.

.5 Concrete foundation sills placed on undisturbed soils/rock to provide smooth level bearing or as specified. Foundation shall include grouted dowels at minimum spacing as specified.

.6 Placement of free draining backfill and PVC drainage as indicated on the construction drawings.

### 1.3 DEFINITIONS

.1 A Rundlestone wall is a minimum of 305 mm thick masonary wall formed with stone masonry units of mortar construction founded on a concrete sill on bedrock. The appearance of the walls should be as close as possible to the existing Rundle Stone walls along the trail.

.2 Mortar grout is a cementitious product used to bond the Rundle Stones or concrete foundations.

### 1.4 MEASUREMENT PROCEDURES

.1 Payment for Rundle Wall Construction will be made at the Lump Sum Contract price. The tendered unit price shall be full compensation for supplying all material, labour and equipment to execute the work as specified excluding the Rundle Stone which shall be supplied by Parks Canada and delivered to the parking lot.

.2 Payment for Foundation Repair Payment will be made at the Lump Sum Contract price. The tendered unit price shall be full compensation for supplying all material, labour and equipment to execute the work as specified.

.3 Rock bolts or other foundation anchors, if required, will be measured as linear metres of rock bolts. (Section 31 23 23)

## PART 2 PRODUCTS

**2.1 MASONRY UNITS**

.1 Stone masonry units to be approximately 203 mm high by 610 mm long by 305 mm deep, with similar strength, colour and texture to the existing adjacent walls.

**2.2 TYPES OF MORTAR**

.2 The mortar for Rundle Stone Wall Construction shall conform to CSA A179, Type S cement mortar produced by a recognized manufactured of mortar products.

.3 The mortar for Catwalk Foundation Repair shall be Emaco® Nanocrete R4 or approved equivalent produced by a recognized manufactured of mortar products.

.4 Mixing: Combine and thoroughly mix cementitious materials, water, aggregates and admixtures in a mechanical batch mixer. Comply with applicable ASTM standards and material manufacturer's recommendations for mixing time and water content. Measure and batch materials by volume so that required proportions can be accurately controlled and maintained.

**2.3 CONCRETE**

.1 Concrete shall be redi-mixed concrete conforming to CSA A23.1-14 and CSA A23.2-14 and have a compressive strength of no less than 25 MPa. Type F-2

.2 Grout shall conform to CSA A179, 12.5 MPa strength at 28 days.

**2.5 REINFORCEMENT**

.1 Reinforcing steel shall conform to CSA G30.18 Grade 400, sized and spaced as designated on construction drawings.

**2.6 DRAINAGE**

.1 Drainage weep holes to be made of PVC 75mm diameter schedule 40 pipe and tied to 102mm diameter flexible perforated drainpipe. The wall shall have weep holes at spacing as specified.

**2.7 GEOTEXTILE**

.1 Woven geotextile for drain pipe wrapping shall be non-woven ARMTEC 250 or approved equivalent.

## PART 3 EXECUTION

### 3.1 SUBMITTALS

.1 Product Data: Submit manufacturer's product data for each type of masonry unit, accessory and other manufactured products.

.2 Compliance: Submit certifications that each type complies with specified requirements.

.3 Samples: For verifications purposes submit:

.1 Colored masonry mortar samples for each color required showing the full range of color which can be used in the finished work. Label samples to indicate type and amount of colorant used.

### 3.2 QUALITY CONTROL

.1 Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

.2 Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

.3 Field constructed Mock-Ups: Prior to installation of masonry work, erect representative sample wall panels to further verify selections made for color and texture characteristics, under sample submittals of masonry units and mortar, and to establish a standard for completed masonry work for qualities of appearance, materials, construction and workmanship.

.4 Grout and concrete specimen shall be sampled and tested for compressive strength and sump.

### 3.3 GENERAL REQUIREMENTS

.1 Deliver masonry material to project in undamaged condition of the ground. Store and handle materials to prevent their deterioration or damage due to moisture, temperature, changes, contaminants, and corrosion or other causes.

.2 Deliver cementitious materials in dry condition with manufacture's label intact.

.3 Limit moisture absorption of stone masonry units during delivery and until time of installation.

.4 Store cemenitious materials in accordance with CSA A5, off the ground, under cover and in a dry location. Protect pre-mixed mortar as well.

.5 Store and protect aggregates where grading and other required characteristics can be maintained.

.6 Mortar beds shall not be more than 15 mm thick unless approved by the Departmental Representative.

.7 Store and protect masonry accessories including metal items to prevent deterioration by corrosion and accumulation dirt.

.8 The contractor shall provide all other supplies, labour, and equipment necessary to construct said Rundle stone masonry wall during the work.

.9 Prior to placing stone masonry remove laitance, loose aggregate or other material that would prevent mortar from bonding to the foundation.

.10 Foundation to be 100mm minimum thick cast in place concrete sill, into a 450mm wide trench on undisturbed soils/rock and leveled as specified. Concrete sill shall include 15M dowels at minimum 600 spacing.

.11 Reinforcing steel dowels to be grouted minimum 400 mm embedment into rock. Holes formed shall be as per Specification 31 23 23 – Rock Bolting.

.12 Maintain masonry courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.

.13 Construct masonry work in accordance with tolerances indicated in the construction drawings. Lay masonry units in running or stacked bond to match existing adjacent walls appearance. Lay masonry units with accurately spaced courses, true to lines and levels.

.14 Stone wall shall have a sloping face to match existing.

.15 In Progress Cleaning

.1 Remove excess mortar from the masonry and the asphalt on the trail.

.2 Dry brush exposed masonry prior to the end of each workday.

.3 Pointing shall be undertaken as per the two adjacent walls.

.4 Protect wall from mud splatter and mortar droppings.

.5 Place Concrete Masonry Unit such that mortar does not run down the face of the wall or smear the masonry face.

.16 During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 0.6 m down both sides and hold cover securely in place.

.17 Do not apply concentrated loads for at least 3 days after building masonry wall or columns.

.18 The backfill shall be 19mm crushed rock with less than 10% fines. Site won material may be acceptable

.19 Backfill placement shall commence at the back of the wall and progress towards the retained material.

.20 Protect sills, ledges, and projections from droppings of mortar.

.21 Cold Weather Protection:

.1 Do not lay masonry units that are wet or frozen.

.2 Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.

.3 Remove masonry damaged by freezing conditions.

.22 Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperature existing at time of installation, except for grout.

.1 5°C to 0°C: Mortar: Heat mixing water to produce mortar temperature between 5°C and 50°C.

.2 0°C to -7°C F: Mortar: Heat mixing water and sand to produce mortar temperatures between 5°C and 50°C. Maintain temperature of mortar on boards above freezing.

.23 Protect completed masonry and masonry not being worked on in the following manner:

.1 5°C to 0°C: Protect masonry from rain or snow for at least 24 hours by covering with weather-resistant membrane.

.2 0°C to -4°C F: Completely cover masonry with weather-resistant membrane for at least 24 hours.

.3 -4°C to -7°C: Completely cover masonry with weather-resistant insulating blankets or similar protection for at least 24 hours: 48 hours for grouted masonry.

.24 Drainage weep holes to be provided at maximum 3 m spacing. Drain pipe shall be wrapped with geotextile and sloped to outlet weep holes.

## 3.4 ENVIRONMENTAL REQUIREMENTS

.1 Not used

**END OF SECTION**