



Project No. R.113350.001

SPECIFICATIONS – Issued for Tender

For:
ISSF Road Rehabilitation Phase 1, Inuvik, NT

Date of Issue: July 22, 2022

APPROVED BY:

Regional Manager, AES

Date

Construction Safety Coordinator

Date

TENDER:

Project Manager

Date



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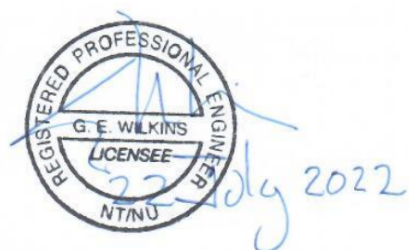
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3	PLAN / PROFILE STA. 100+000 TO STA. 100+680	C101	0
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PART 1 **GENERAL**

1.1 **ORDER OF PRECEDENCE**

- .1 In the event of any discrepancy or conflict, order of precedence shall be in accordance with GC1.2.2 – Order of Precedence and as follows:
 - .1 The Division 1 Sections of these Specifications take precedence over the other sections of the Specifications.
 - .2 If conflict arises between an item in the main body of these Specifications (Division 1 – Division 33) and an item found in one of the Appendices (Reference Documents), the main body of the Specifications (Division 1 – Division 33) shall govern.
 - .3 Any technical and manufacturer's standard, Government Act, Regulation or Code of practice referred to in the Contract documents shall be the version current (including applicable Amendments) available at the time of tender closing.

1.2 **PROJECT LOCATION**

- .1 The project is located outside the town of Inuvik, Northwest Territories at the Inuvik Satellite Station Facility (ISSF), as shown on the Contract Drawings. The ISSF is accessed from Highway 8 (Dempster Highway) at approximately Km 264. For reference, Inuvik is located at approximately Km 271 of Highway 8.
- .2 The Contractor may elect to produce aggregate material in the GNWT Pit Km 251 Quarry Site accessed off Highway 8, or at other pit / quarry location(s) selected by the Contractor and acceptable to the Departmental Representative. Refer to Section 31 05 16 – Aggregates: General for further information.

1.3 **WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work in the Contract includes rehabilitation of the existing road network. Specific work items are described in .2 below.
- .2 Without limiting the scope of work, the work of this Contract generally comprises the following, but is not limited to:
 - .1 Project Management including all requirements of Section 01 31 00 – Project Management and Coordination.
 - .2 Contract submittals (using "Autodesk BIM 360") prior to and during the work (see Section 01 25 20 – Mobilization and Demobilization and Section 01 33 00 – Submittal Procedures).
 - .3 Supply and maintain all traffic control for the duration of the works (see Section 01 35 00 – Traffic Management).
 - .4 Quality Management and Quality Control (see Section 01 45 00 – Quality Management).
 - .5 Environmental protection (see Section 01 35 43 – Environmental Protection).
 - .1 In preparation for and during construction of this project, an Environmental Construction Operations Plan (ECO Plan) otherwise known as an Environmental Management Plan (EMP) shall be prepared by the Contractor to meet the requirements of Section 01 35 43 – Environmental Protection to ensure minimal adverse effects occur. The Contractor's ECO Plan must be approved by the Departmental Representative prior to the commencement of construction. The



Departmental Representative will refer to the approved ECO Plan in determining compliance with the plan and contract specifications. The ECO Plan will form part of the contract.

- .6 Surveys, including Preconstruction Survey, construction progress surveys, and as-built survey (see Section 01 29 00 – Payment Procedures).
- .7 Development of construction access to facilitate construction. Restoration of the disturbed areas following construction (see Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration).
- .8 Clearing and brushing of trees and vegetation within the construction footprint necessary to facilitate the work, and offsite disposal to the Inuvik Solid Waste Disposal Facility (see Section 31 11 00 – Clearing and Brushing).
- .9 Common Excavation of the existing road embankment, including loading, stockpiling and compacting at the ISSF Old Borrow Site (Town Pit) (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).
- .10 Supply and installation of Nonwoven Geotextile (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).
- .11 Supply, haul, placement, and compaction of Embankment – 300 mm Minus and Embankment – 75 mm Minus (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).
- .12 Supply, haul, placement and compaction of Sub-Base Gravel (see Section 32 11 19 – Sub-Base Gravel).
- .13 Supply, haul, placement and compaction of Surfacing Gravel (see Section 32 11 25 – Surfacing Gravel).
- .14 Regrading and recompacting Surfacing Gravel in unfrozen conditions (see Section 32 11 25 – Surfacing Gravel).
- .15 Manufacture, load, transport and stockpile Surfacing Gravel for future maintenance purposes at the North Leg turnaround area (see Section 32 11 25 – Surfacing Gravel).
- .16 Excavation, removal and offsite disposal of existing culverts and culvert segments (see Section 33 42 13 – Pipe Culverts).
- .17 Extension of existing culverts and installation of new aluminized Corrugated Steel Pipe (CSP) culverts, including couplings, fittings and hardware (see Section 33 42 13 – Pipe Culverts).
- .18 Installation of culvert riprap end treatments (see Section 33 42 13 – Pipe Culverts).
- .19 Addressing ponding areas and providing positive drainage in roadside ditches / drainages via the installation and grading of Sub-Base Gravel material (see Section 32 11 19 – Sub-Base Gravel).
- .20 Construction of Ditch Blocks via the supply, haul, placement and compaction of Sub-Base Gravel (see Section 32 11 19 – Sub-Base Gravel).
- .21 Removal and disposal of existing gate, the supply installation of a new security gate complete with steel pipe piles and riprap boulders (see Section 10 14 53 – Traffic Signs and Gates).
- .22 Supply and installation of new traffic signs (see Section 10 14 53 – Traffic Signs and Gates).
- .23 Removal, temporary stockpiling, and reinstallation of existing traffic signs (see Section 10 14 53 – Traffic Signs and Gates).



- .24 Removal and disposal of existing delineators, and supply and installation of new delineators (see Section 10 14 53 – Traffic Signs and Gates).
- .25 Roadway dust control (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).
- .26 Work completed by Change Order (if required and approved by Departmental Representative).

1.4 CONTRACT METHOD

- .1 Construct Work under unit price contract.

1.5 WORK BY OTHERS

- .1 The Contractor shall coordinate all work on this project with other Contractors and maintenance crews, including Health and Safety and Traffic Management. No claims for any delays or inconvenience will be considered.
- .2 The pits mentioned in the Contract Documents are operational pits and are used by many Contractors. The Contractor shall cooperate with the other users of the pits, including coordination and identification of a site Prime Contractor.

1.6 CONSTRUCTION SIGNAGE

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

1.7 CONTRACTOR'S PERSONNEL

- .1 Upon request by the Departmental Representative, the Contractor shall remove any personnel from the project work site who, in the opinion of the Departmental Representative, are incompetent or have been guilty of improper conduct.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 SITE VISIT

- .1 There is no scheduled site visit. However, it is recommended that bidders make inquiries or investigations necessary to become thoroughly acquainted with the site, as well as the nature and extent of the work.



- .2 Submission of a bid is deemed to be confirmation that the Contractor has inspected the site and is conversant with all conditions affecting execution and completion of the work.

3.2 WORK COMPLETION

- .1 Preparation of required submittals to commence immediately upon receipt of notice to proceed and to be completed prior to commencement of work (unless specified otherwise).
- .2 Achieve Substantial Performance by March 31, 2023.
- .3 Achieve Completion by July 15, 2023.
- .4 Works may need to be temporarily shut down during high flow, heavy rain events, or other adverse weather conditions. The works may be stopped by the following processes:
 - .1 The Contractor with approval from the Departmental Representative shall suspend works should high water flows or poor weather conditions adversely affect the Contractor's ability to achieve the Contract Specifications for quality of work.
 - .2 The Contractor's Qualified Professional retained to complete Environmental Inspections, with approval from the Departmental Representative, may suspend work should they feel it is not possible to achieve the environmental requirements due to the high water flows or adverse weather conditions.
 - .3 The Departmental Representative, in conjunction with representatives of Authorities Having Jurisdiction, may suspend instream works should they feel that it is not possible to achieve the environmental requirements, or the contract specifications for quality of work due to the high water flows or adverse weather conditions.
- .5 Regardless of who suspends the work, the Contractor will be responsible for maintaining the site and protecting the works throughout the suspension period to ensure the site is in an acceptable condition safe to the public.
- .6 The Contractor shall account for the possibility of not being able to complete work due to high water flows or adverse weather conditions in the construction schedule and in the unit prices. No payment for temporary work stoppages due to high water flows or adverse weather conditions will be made.
- .7 The Contractor shall account for possible impacts of COVID-19 in the construction schedule and the unit prices. The Contractor shall keep informed with the latest federal and territorial recommendations and protocols regarding COVID-19 at all times during construction and shall modify their construction approach accordingly to ensure adherence to these recommendations and protocols.
- .8 If federal and/or territorial recommendations require that the project work be stopped, the Contractor shall consult with the Departmental Representative, and the Departmental Representative will advise as to the course of action the Contractor shall take. Any monetary impact to the Contractor from the work being stopped due to federal and/or territorial recommendations will be addressed in accordance with the contract general conditions.

3.3 SEQUENCE OF WORK

- .1 The project shall be completed per the dates provided in Item 3.2 Work Completion and the following construction sequencing:
 - .1 The Contractor shall complete the following items of work prior to the ground freezing in the Fall of 2022:



- .1 Clearing and Brushing required to facilitate roadway widening (see Section 31 11 00 – Clearing and Brushing).
- .2 Nonwoven Geotextile required to facilitate roadway widening (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).
- .3 Excavation, loading, hauling and stockpiling of Common Excavation required to facilitate roadway widening (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).
- .4 Supply, placement, and compaction of Embankment – 300 mm Minus and Embankment – 75 mm Minus material in areas of roadway widening (Unit Price Item No. 6).
 - .1 Should the Contractor not place and compact Embankment material in all areas of roadway widening prior to the ground freezing in the Fall of 2022, the Contractor shall continue to place Embankment in frozen conditions during Winter 2022-23, provided the Contractor strips the organic material beneath the roadway widening Embankment limits. The cost to complete Stripping, including offsite disposal, and the associated additional quantity of Embankment placed as a result of the Stripping will not be measured for payment and shall be borne by the Contractor (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).
- .2 The Contractor shall undertake the following items of work in unfrozen conditions following thaw in Spring 2023. These work items shall be undertaken after the date of Substantial Performance but prior to date of Completion noted in Item 3.2 Work Completion:
 - .1 Regrade and recompact of Surfacing Gravel (see Section 32 11 25 – Surfacing Gravel).
 - .2 Track packing of Embankment sideslopes (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).
 - .3 Ponding area infill (see Section 32 11 19 – Sub-Base Gravel).
 - .4 Security gate supply and installation (see Section 10 14 53 – Traffic Signs and Gates).
 - .5 Traffic sign and delineator supply and installation / reinstallation (see Section 10 14 53 – Traffic Signs and Gates).
- .3 All other construction activities to be completed by date of Substantial Performance, except as noted in 3.3.1.2 above.
- .4 All other work items may be completed by the Contractor during frozen conditions in Winter 2022-23, but prior to the date of Substantial Performance noted in Item 3.2 Work Completion.

3.4 CONTRACTOR'S USE OF SITE

- .1 Restrict work to within the construction footprint shown on the Contract Drawings and as agreed to by the Departmental Representative.
- .2 Any additional areas required by the Contractor outside the lands owned or leased by the Departmental Representative and designated for use on this project, shall be the Contractor's responsibility to organize. Any costs associated with the use of these additional lands shall be the Contractor's responsibility.



- .3 Assume full responsibility for protection and safekeeping of products under this contract.
- .4 The Departmental Representative will provide the Contractor with a gate key for the ISSF site upon commencement of the onsite work. While the Work Site is under the Contractor's control, the Contractor shall be entirely responsible for the security of the Work Site and of the Work.

3.5 SPECIAL PRECAUTIONS

- .1 The Contractor's attention is drawn to the possibility of impacting utilities, etc., within the limits of work. The Contractor shall confirm the locations of all such utilities. All costs for utility locates shall be incidental to the work. The Contractor shall notify the Departmental Representative should utilities be located in areas other than those shown on the drawings or if they conflict with the construction, and await instructions from the Departmental Representative before proceeding with work in the vicinity of such encountered services and utilities.
- .2 Unless where identified on the Contract Drawings, existing structures, signs, utilities, Bituminous Surface Treatment (BST) or asphalt pavement, culverts, cut & fill slopes, ditches, street furniture and all other structures, services, piping or equipment within the limits of work shall be properly protected from any injury or damage, direct or indirect. Any damage that is caused as a result of the operations of the Contractor shall be repaired and made good at the Contractor's expense to the satisfaction of the Departmental Representative.
- .3 Protect existing memorial shown on the Contract Drawings at all times during construction, at a minimum by the installation and maintenance of temporary fencing / barrier in conformance with Section 01 56 00 – Temporary Barriers and Enclosures.

3.6 SURVEY

- .1 The Contractor shall be responsible to complete a Preconstruction Survey (see Section 01 29 00 – Payment Procedures), all layout surveys to complete the work per the design lines and grades, survey of construction for measurement for payment (see Section 01 29 00 – Payment Procedures), and as-built surveys (see Section 01 78 00 – Closeout Submittals). All surveys shall achieve the following:
 - .1 Be completed / collected to an accuracy of +/- 0.02 m horizontal and +/- 0.02 m vertical or better and shall be referenced / tie into the monument / coordinate system as shown on the Contract Drawings.
 - .2 Use industry standards, methods, equipment, and the survey requirements of Section 01 29 00 – Payment Procedures, and other approaches (if necessary) as preapproved by the Departmental Representative.
- .2 All layout surveys, quantity surveys, and as-built surveys shall be considered incidental to the work and will not be measured for payment.
- .3 All layout surveys, quantity surveys, and quantity calculations for the purposes of progress payments shall be completed by a Professional Engineer, an Applied Science Technologist or Certified Engineering Technician, or other qualified surveyor, with the knowledge, skills and abilities acceptable to the Departmental Representative. The surveyor or person(s) used for these tasks shall have a minimum of five (5) years' experience working on projects of similar size, scope and cost.
- .4 Prior to starting on-site construction work, complete Preconstruction Survey including a check of the survey control monument coordinates and elevations provided by the Departmental Representative via a static survey of each monument. Provide Preconstruction Survey and results to the



Departmental Representative for review and acceptance. If deemed necessary by the Departmental Representative, design adjustments may be made by the Departmental Representative to suit the findings of the monument survey checks. Refer to Section 01 29 00 – Payment Procedures for further details.

- .5 Establish working control points based on survey control monuments provided (other monuments not listed on the Contract Drawings shall not be used). Report to the Departmental Representative when a working control point is lost or destroyed as a result of necessary work. Replace working control points from the project survey control monuments.
- .6 Establish / layout the proposed alignment(s) and grades using paint lines and survey stakes based on working control points and survey control monuments provided.
- .7 The Departmental Representative may elect to verify surveys. Verification of the survey by the Departmental Representative does not abdicate the Contractor's responsibility for the correctness and accuracy of the survey.
- .8 Maintain a complete, accurate log of control and survey work as it progresses. On request of the Departmental Representative, submit documentation to verify the accuracy of the field engineering work.
- .9 The Contractor shall regularly monitor the condition of the Work Site and of property on and adjoining the Work Site throughout the construction period, and shall immediately notify the Departmental Representative if any deterioration in condition is detected. Such monitoring shall cover all pertinent features and property including, but not limited to, buildings, structures, roads, walls, fences, slopes, culverts and landscaped areas.
- .10 The Departmental Representative may, but shall not be obligated to, survey and record the condition of the Work Site and of property on or adjoining the Work Site prior to the commencement of construction by the Contractor. If a survey is undertaken and if requested by the Contractor, the Departmental Representative will provide a copy of the survey records to the Contractor for reference.
- .11 Whenever supplied with survey records, the Contractor shall satisfy itself as to the accuracy and completeness of the survey records provided by the Departmental Representative for any area before commencing construction in that area. Commencement of construction in any area shall be interpreted to signify that the Contractor has accepted such survey records as being a true record of the existing conditions prior to construction.
- .12 The provision of the records of a survey of existing conditions by the Departmental Representative shall in no way limit or restrict the Contractor's responsibility to exercise proper care to prevent damage to all property within or adjacent to the Work Site, whether all such property is covered by the survey or not.

3.7

CONTRACT DRAWINGS

- .1 The Contractor shall be responsible for printing "Issued for Construction" or "Issued for Tender" hardcopy Contract Drawing sets. Preparation and plotting of the hardcopy drawing sets shall be considered incidental to the Work.
- .2 Upon award of the project, the Departmental Representative will provide the successful Contractor with a digital PDF version of the "Issued for Construction" or "Issued for Tender" Contract Drawings. Preparation of the PDF drawing file may take up to 14 calendar days.



3.8 ELECTRONIC CONTRACT DRAWINGS

- .1 If requested by the Contractor, the Departmental Representative will provide the Contractor with available Contract Drawings in electronic format for the Contractor to reference throughout the work.
- .2 The format and software of the electronic Contract Drawings shall be at the Departmental Representative's discretion.
- .3 The Departmental Representative accepts no responsibility for the accuracy or completeness of the electronic Contract Drawings. Should the Contractor choose to reference the electronic Contract Drawings, the Contractor shall satisfy itself as to the accuracy and completeness of the electronic Contract Drawings before commencing construction. Should a discrepancy between the electronic Contract Drawings and the hardcopy Contract Drawings be discovered (at any time during the work), the hardcopy Contract Drawings shall govern. The Contractor will be responsible for all costs associated with any corrections to ensure the work is in conformance with the hardcopy Contract Drawings. The Departmental Representative shall not be responsible for updating or correcting any discrepancies between the electronic Contract Drawings and the hardcopy Contract Drawings identified by the Contractor.

3.9 CONTRACT SUBMITTALS

- .1 Complete and submit for the Departmental Representative's review all required Contract Submittals as detailed in the relevant sections of the Contract Specifications. Work affected by the submittals shall not proceed until the submittal is accepted by the Departmental Representative. The Contractor shall allow in the construction schedule submittal review periods as required for each submittal and as detailed in Section 01 33 00 – Submittal Procedures. Required submittals include, but are not limited to, the following:
 - .1 Project Schedule (see Section 01 32 16 – Construction Progress Schedules – Bar (Gantt) Chart).
 - .2 Cash flow forecasting (see Section 01 31 00 – Project Management and Coordination).
 - .3 Traffic Management Plan (see Section 01 35 00 – Traffic Management).
 - .4 Project Specific Health and Safety Plan (see Section 01 35 33 – Health and Safety).
 - .5 Environmental Construction Operations Plan (see Section 01 35 43 – Environmental Protection).
 - .6 Quality Management Plan and related Quality Management documentation (see Section 01 45 00 – Quality Management).
 - .7 Hazardous Materials Management Plan (see Section 02 61 33 – Hazardous Materials).
 - .8 Preconstruction Survey (see Section 01 29 00 – Payment Procedures).
 - .9 As-built Survey, As-built Drawing mark-ups, and Shop Drawing mark-ups (see Section 01 78 00 – Closeout Submittals).
 - .10 Shop Drawings (if applicable, including professional seal for design work required), Product Data / and Samples.
 - .11 Progress Payment Submittal Form (see Appendix B).
 - .12 General Contractor & Sub-Contractor Construction Equipment List (see Section 01 52 00 – Construction Facilities and Equipment and Appendix C).



3.10 SUPERVISORY PERSONNEL

- .1 Within five (5) calendar days of Contract 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. At a minimum, the following personnel shall be included on the list:
 - .1 Project Superintendent.
 - .2 Deputy Project Superintendent.
 - .3 Health and Safety Coordinator.
 - .4 Quality Control Manager.
 - .5 Qualified Professional retained to complete Environmental Inspection(s).
- .2 The above personnel shall perform the following duties:
 - .1 Project Superintendent: shall be employed fulltime and shall be present on the Work Site each and every day that Work is being performed, from the commencement of work to Substantial Performance and Completion of the Work.
 - .2 Deputy Project Superintendent: shall have the authority of the Project Superintendent during the latter's absence for short periods of time.
 - .3 Health and Safety Coordinator: shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement of work until Substantial Performance and Completion of the Work (see Section 01 35 33 – Health and Safety for further requirements).
 - .4 Quality Control Manager: shall be independent from the Contractor, experienced in Quality Management, dedicated to quality matters from commencement of work until Substantial Performance and Completion of the Work, and remain onsite at all times the Contractor is performing work which must be tested or inspected in-process (see Section 01 45 00 – Quality Management for further requirements).
 - .5 Qualified Professional retained to complete Environmental Inspections: (see Section 01 35 43 – Environmental Protection for further requirements).

3.11 WORK BY OTHERS

- .1 The Contractor is advised that concurrent with this project there may be other Contractors working in nearby adjacent projects. Should other Contractors be working in nearby adjacent projects, the Contractor shall coordinate their operations with the other Contractors, including traffic management.

3.12 DEPARTMENTAL REPRESENTATIVE'S OFFICE TRAILER

- .1 Office Trailer: See Section 01 52 00 – Construction Facilities and Equipment for requirements for the Departmental Representative's office trailer. Office trailer to be supplied and maintained by the Contractor.

3.13 USE OF PITS AND QUARRIES

- .1 The Contractor may choose to use pits and quarries as detailed elsewhere within the Specifications for the purposes of stockpiling common excavation and extraction / manufacture of granular materials. When using gravel pits and quarries, the Contractor shall be aware of the following:



- .1 Other Contractors may be working in the pits and quarries completing similar or different types of work. Coordination with these other Contractors will be required.
- .2 Laydown areas for equipment and stockpiles may be restricted due to other works ongoing or the existing size of the pits and quarries.
- .3 The Contractor is responsible for providing all equipment required to excavate, screen, manufacture (as necessary), load, and haul the material from the pits and quarries.
- .4 The security of equipment parked and material manufactured and stockpiled in the pits and quarries along with the safety of the Contractor's personnel remains the Contractor's responsibility.
- .5 The Departmental Representative will provide the Contractor with a gate key for the ISSF Old Borrow Site (Town Pit) upon commencement of the onsite work. The Contractor shall be responsible for locking the vehicle gate any time the Contractor's personnel have vacated the ISSF Old Borrow Site (Town Pit), regardless of duration. The Contractor shall return the gate key to the Departmental Representative upon completion of the work.
- .6 The Contractor shall be responsible for maintaining access roads into the pits and quarries and for haul roads required to stockpile Common Excavation material and access the aggregate sources for the duration of the project. At a minimum, maintaining and developing access may include grading, snow removal and dust control (refer to Section 31 24 14 – Roadway Excavation, Embankment, and Compaction for further details). At the conclusion of the works all access roads and haul roads shall be left in a condition equal to or better than when work started. Maintenance of access roads, including grading and snow removal, will not be paid separately, and will be considered incidental to the contract.

END OF SECTION



PART 1 **GENERAL**

1.1 **USE OF WORK SITE**

- .1 The Work Site will be specified by the Departmental Representative and shall only be used for the purposes of the Work. The Work Site will be made available to the Contractor for its exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.
- .2 The Contractor's office trailer may be set up in the locations identified in Section 01 52 00 – Construction Facilities and Equipment. The Contractor's construction camp may be set up in the locations identified in Section 01 59 10 – Construction Camp.
- .3 While the Work Site is under the Contractor's control, the Contractor shall be entirely responsible for the security of the Work Site and of the Work.
- .4 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and garbage regardless of the source. Snow / ice shall be removed by the Contractor as necessary for the performance and inspection of the Work.
- .5 The Contractor shall provide sanitary facilities for the work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep the area and premises in sanitary condition.
- .6 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at the Contractor's expense.

1.2 **WORKING HOURS**

- .1 The Contractor may work seven (7) days per week subject to the following restrictions:
 - .1 Work in excess of 12 hours per day shall require pre-approval from the Departmental Representative. At a minimum, pre-approval shall require a plan from the Contractor to ensure all necessary Quality Control work per the contract requirements is completed during all times of work. The Departmental Representative may withdraw approval for the extended work hours at any time should the Contractor fail to achieve all necessary Quality Control requirements or any other contractual requirement as a result of the extended work hours.
 - .2 Work during non-daylight hours shall be lit with Contractor supplied lighting such that none of the work is being completed in darkness. The Contractor shall provide details of the illumination to be provided during non-daylight hours in the Contractor's Traffic Management Plan and Project Specific Health and Safety Plan (refer to Section 01 35 00 – Traffic Management and Section 01 35 33 – Health and Safety for details).

1.3 **WORK CONDUCTED IN AND ADJACENT TO WATERWAYS**

- .1 All components of the work shall be conducted in accordance with Section 01 35 43 – Environmental Protection.



1.4 PROTECTION OF PERSONS AND PROPERTY

- .1 The Contractor shall comply with all applicable safety regulations of WSCC including, but not limited to, the Workers Compensation Act, Occupational Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations (see Section 01 35 33 – Health and Safety for additional requirements).
- .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.
- .3 The Contractor shall promptly take such measures as are required to repair, replace or compensate for any loss or damage caused by the Contractor to any property.

1.5 USE OF PUBLIC AREAS

- .1 Off-road construction equipment (equipment which exceeds legal highway load limits or dimensions) will not be allowed on public highways / roads outside the limits of the work shown on the Contract Drawings. Steel tracked equipment with cleats will not be allowed on asphalt / BST surfaces outside the limits of the work.
- .2 The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud, dirt, snow, and ice clinging to the body and wheels of the vehicle. All vehicles arriving at or leaving the Work Site and transporting materials shall be loaded in a manner which will prevent dropping of materials or debris on the roadways, and, where contents may otherwise be blown off during transit, such loads shall be covered by tarpaulins or other suitable covers. Spills of material, including rocks and debris from loaded trucks, 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 Protection and the Environmental Construction Operations Plan (ECO Plan) prepared by the Contractor for the project.
- .3 The traveled lanes of the Highway shall remain a Public Highway subject to the rules and laws of Public Highways. The Contractor is responsible for ensuring all equipment accessing the Highway meets all requirements for vehicles traveling on Public Highways in the Territory.

1.6 USE OF PITS AND QUARRIES

- .1 No separate payment will be made for clearing, grubbing, disposal or relocation of stockpiles, debris or contaminated materials, or for any other costs of site preparation, pit development, or access, or for any delay or other cost arising from the use of pits by others, and all costs thereof shall be covered in the prices for Items under which payment is provided for the applicable materials.

1.7 CONSTRUCTION SIGNAGE

- .1 No Signs or advertisements, other than regulatory or warning signs, PSPC supplied signage, and portable electrically illuminated message signs are permitted on site.
- .2 Signs and notices for safety and instruction shall be provided by the Contractor (see Section 01 35 00 – Traffic Management for additional details).
- .3 Maintain approved signs and notices in good condition for duration of Project, and dispose of off-site on completion of Project or earlier as directed by the Departmental Representative.



- .4 Signage shall be coordinated with other Contractors working in the area as needed.

1.8 ACCESS AND EGRESS

- .1 The Contractor is required to develop access to the required work areas. The Contractor is fully responsible for the selection and implementation of all methods to accomplish this requirement. Any access roads or trails extending outside the limits of the work shall be submitted to the Departmental Representative for approval. All construction access shall be completed in conformance with the requirements of Section 01 35 43 – Environmental Protection and the Contractor's ECO Plan.
- .2 Design, construct and maintain temporary "access to" and "egress from" work areas, including construction turnaround areas, stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, territorial and other regulations. The construction turnaround areas were previously used for the initial construction of the road and are marked on the drawings. The contractor is allowed to use these construction turnaround areas for his use. No other construction turnarounds will be permitted without authorization from the Departmental Representative.
- .3 The Contractor is required to develop access to the required work areas. The Contractor is fully responsible for the selection and implementation of all methods to accomplish this requirement. All construction access shall be completed in conformance with the requirements of Section 01 35 43 – Environmental Protection, and the Contractor's accepted ECO Plan.

1.9 CONSTRUCTION START-UP

- .1 The Contractor or Sub-contractors shall not perform any on site work until all necessary submittals have been provided, reviewed, and accepted by the Departmental Representative and the Contractor has received from the Departmental Representative a completed version of the "On-site Construction Start-up Form" (see Appendix A) which has been completed and signed by the Departmental Representative. PSPC reserves the right to refuse payment for any on-site work performed prior to issuing the completed and signed "On-site Construction Start-up Form".

1.10 CONSTRUCTION STAGING

- .1 The Contractor shall stage the work ensuring that:
 - .1 All design requirements as specified in the Contract Drawings, contractor prepared Shop Drawings, and contract specifications are achieved.
 - .2 All requirements of Section 01 35 00 – Traffic Management are achieved.
 - .3 All requirements of the Section 01 35 43 – Environmental Protection and the Contractor's Environmental Protection Plan are achieved.
 - .4 The work is completed in accordance with the dates for Substantial Performance and Completion provided in Section 01 11 10 – Summary of Work.
 - .5 The work (including stockpiling of excavated materials for offsite disposal or imported material prior to placement) is completed such that no part of the work, existing ground, or infrastructure is subject to a load or force which will endanger its safety or will cause deformation. To achieve this requirement, the Contractor may need to immediately load all excavated materials (no onsite stockpile) and immediately place and finish placement of each load of material brought to site prior to the arrival of subsequent loads of material.



The Contractor is fully responsible for the selection and implementation of all methods to accomplish these requirements.

1.11 SURVEY OF EXISTING PROPERTY CONDITIONS

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

1.12 RESTORATION

- .1 Remove access points, roads, detours, construction turnaround areas, laydown areas, pads, and all other works installed during access development and construction staging. Re-instate the worksite to a condition equal to or better than the site condition prior to construction by:
 - .1 Restoring organic soils (if removed or damaged during access development or other works).
 - .2 Eliminating uneven areas and low spots.
 - .3 Restoring existing drainage patterns and ensuring there is no ponding water.
 - .4 Removal of all gravels, other materials, and structures placed to create access points, temporary detour roads, or pads. Dispose of gravels, other materials, or structures at an off-site disposal facility acceptable to the Departmental Representative.

1.13 WASTE DISPOSAL

- .1 All surplus, unsuitable and waste materials shall be removed from the job site to approved sites. Refer to Section 01 35 43 – Environmental Protection and the ECO Plan.
- .2 Deposit of any construction debris into any waterway is strictly forbidden.
- .3 Cost for Waste Disposal described above shall be considered incidental to the Unit Price items and no additional payment will be made.



- .4 Waste Disposal shall be completed in accordance with Section 01 35 43 – Environmental Protection.

1.14 WORK STOPPAGE

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

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **DEFINITIONS**

- .1 Mobilization and Demobilization: consists of preparatory work and operations including but not limited to:
 - .1 Preparation of submittals and acceptance by the Departmental Representative (Construction Schedule, Preconstruction Survey, Traffic Management Plan, Quality Management Plan, ECO Plan, Project Specific Health and Safety Plan, and any other submittals required prior to starting work).
 - .2 Work and costs incurred necessary for the movement of personnel, equipment, supplies and incidentals to / from the work site.
 - .3 Work and cost incurred in the establishment and operation of offices, camps, and other facilities necessary to undertake the work.
 - .4 Work and costs incurred in the completion of cleanup and project completion.
 - .5 All other work and costs incurred in the successful completion of Mobilization and Demobilization.

1.2 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for Mobilization and Demobilization will be made on the basis of the Price per Unit Bid for **“Mobilization and Demobilization”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs associated with the items of work listed in 1.1 Definitions above.
- .2 Measurement for Payment for completion of Mobilization and Demobilization will be made at the Lump Sum price and will be scheduled as follows:
 - .1 50% of the Lump Sum bid price to a maximum of 5% of the Total Tender price at the beginning of construction after the Contractor's required submittals (including Construction Schedule, Preconstruction Survey, Traffic Management Plan, Quality Management Plan, ECO Plan, Project Specific Health and Safety Plan, and any other submittals noted in the Specifications as being required prior to starting work) have been submitted for review, accepted for the work in its entirety, and work onsite has commenced to the satisfaction of the Departmental Representative.
 - .2 50% of the Lump Sum bid price once the project has achieved “Completion” and all equipment has been demobilized from the site, the site has been cleaned to the satisfaction of the Departmental Representative, remaining deficiencies identified during final inspection (Section 01 77 00 – Closeout Procedures) are corrected, and all closeout submittals are provided and accepted by the Departmental Representative and all other Agencies having Jurisdiction.

PART 2 **PRODUCTS**

2.1 **NOT USED**



PART 3

EXECUTION

3.1

NOT USED

END OF SECTION



PART 1 GENERAL

1.1 TERMS OF PAYMENT

- .1 The project's terms of payment shall be per General Conditions (GC) 5 – Terms of Payment. Progress payments shall be submitted by the Contractor on a monthly basis unless accepted otherwise by the Departmental Representative. The progress payment shall use PSPC's Request for Progress Payment – Construction Contracts form: PWGSC-TPSGC 1792, found online.
 - .1 See link to Public Works and Government Services Canada – Acquisition Forms: <http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>.
- .2 With each progress payment, provide to the Departmental Representative the required documentation as listed below. Upon receipt of this required documentation, PSPC will commence a review of the progress payment request in accordance with General Conditions (GC) 5 – Terms of Payment.
 - .1 Documentation required by General Conditions (GC) 5 – Terms of Payment including signed statutory declaration.
 - .2 Progress Payment Request Form (see Appendix B) completed and signed by the Contractor's representative. Upon receipt of this form and all other required documentation, PSPC will commence review of the progress payment request in accordance with General Conditions (GC) 5 – Terms of Payment.
 - .3 WSCC Clearance Letter, indicating the Contractor is in active and good standing per the end date of the progress payment in accordance with Section 51 of the Workers Compensation Act (Departmental Representative may waive this requirement).
 - .4 Updated construction progress schedule (accepted project schedule shown as the baseline and actual start dates / completion dates / percent complete shown for each task, see Section 01 32 16 – Construction Progress Schedules – Bar (Gantt) Chart).
 - .5 Updated cash flow forecast (see Section 01 31 00 – Project Management and Coordination).
 - .6 All survey information (digital csv file with x,y,z data and breaklines in DXF file format) for each payment item claimed on the progress payment and measure by survey as defined in these Contract Specifications.

1.2 BASIS OF PAYMENT

- .1 Basis of payment shall be per the Measurement and Payment Procedures in the applicable specification section. Where not specified, basis of payment for all work included in these specifications or Contract Drawings not specifically mentioned is considered incidental to other work and is part of the Total Contract Amount. No additional payment will be made for incidental work.
- .2 Payment for work shall be made per the Price per Unit as shown in the Unit Price Table.
- .3 For unit price items in the Bid and Acceptance Form, progress payments shall be made based on the quantities of work in place (prior to and upon completion of excavation, or following placement and compaction), compacted (if required), surveyed, and accepted by the Departmental Representative in the field.
- .4 For lump sum items in the Bid and Acceptance Form, progress payments shall be made based on the percent of work completed and accepted by the Departmental Representative at the time of the



monthly progress payment (Excluding Mobilization and Demobilization which is paid per Item 1.2 – Measurement and Payment Procedures of Section 01 25 20 – Measurement and Payment Procedures). Survey may be required to verify the work is completed to the design requirements (thickness, length, grade, volume, area, etc.).

- .5 The Contractor must support any claims for products purchased, manufactured, or delivered to the place of work but not yet incorporated into work. The support for such claims must include such evidence as may be required by the Departmental Representative to establish value and the percentage of the work completed. During or at the completion of the work any products purchased, manufactured, or delivered to the place of work but not incorporated into the work shall be removed from the site at the Contractor's cost and no payment (including adjustment to quantities on previous progress payments, see GC5.2 – Amount Payable) shall be made (excluding items resulting from changes to the work made by the Departmental Representative during the work and brought to the attention of the Departmental Representative by the Contractor at the time of the change).
- .6 Any work called for in the specifications or shown on the Contract Drawings but not specifically mentioned as an item for which payment will be made, will be considered incidental to the items of work listed. No additional payment will be made for this incidental work.
- .7 All equipment, materials, and labour necessary to complete any item of work shall be included in the cost of that work.
- .8 Materials shall be excavated or placed within the specified tolerances of the design lines and grades shown on the Contract Drawings but not uniformly high or low. Materials excavated or placed outside the specified tolerances will not be measured for payment unless pre-approved by the Departmental Representative.
- .9 Measurement for Payment will be at the Departmental Representative's discretion using the following method:
 - .1 Based upon the survey data collected by the Contractor: when the materials have been excavated or placed within the specified tolerances of the design lines and grades shown on the Contract Drawings but not uniformly high or low. No payment will be provided for materials that have been excavated or placed beyond the design lines and grades shown on the Contract Drawings.
- .10 At any point throughout the project, the Departmental Representative may compile and review the survey data (individual surveys or multiple surveys of particular items of work) to reconcile the total quantities of items of work to date on the project. Adjustments to quantities on future progress payments may then be made per GC5.2 – Amount Payable.

1.3

SURVEY

- .1 Surveys shall be undertaken by the Contractor at key times during construction to record Preconstruction conditions, to verify quantities for payment purposes (or in the case of Lump Sum items, to verify that work has been completed to the design requirements), and to record as-built conditions. Survey shall be considered incidental to the work and shall not be measured for payment.
- .2 All quantity surveys, quantity calculations, and surveys to verify the work is completed to the design requirements for the purposes of verifying progress payment quantities (cu.m, sq.m, or L.S.) shall be completed to the design requirements by a Professional Engineer, an Applied Science Technologist or Certified Engineering Technician, or other qualified surveyor, licensed to practice in the Place of Work, with the knowledge, skills and abilities acceptable to the Departmental Representative. The



- surveyor or person(s) used for these tasks shall have a minimum of five (5) years' experience working on projects of similar size, scope and cost.
- .3 Survey data collected shall be of sufficient density to fully characterize the work. Survey methods and location of surveyed cross sections is subject to prior approval of the Departmental Representative. At a minimum, the Contractor shall survey all features at 10 m station intervals and the location of all treatment boundaries including changes in material type / placement, changes in surface treatment, and changes in the terrain.
- .4 A survey of the existing ground surfaces, drainage channels, and other topographic features shall be undertaken by the Contractor prior to initiation of construction, but in areas designated for Clearing and Brushing after the Clearing and Brushing has been completed to the satisfaction of the Departmental Representative. The survey shall be provided to the Departmental Representative for review and acceptance. During construction no material shall be placed unless the applicable surveys on the completed surfaces have been carried out and the data accepted by the Departmental Representative, and the completed surface has been inspected and accepted by the Departmental Representative. At the Departmental Representative's sole discretion, payment for work completed and measured by survey may not be made should the Contractor fail to complete the necessary surveys, or the surveys are of insufficient quality or detail.
- .5 Survey accuracy:
- .1 Survey data shall be collected at an accuracy of ± 0.02 m horizontal and ± 0.02 m vertical or better and shall be referenced / tie into the existing control monument network / coordinate system in UTM Zone 8 NAD 83. The control monumentation is shown on the Contract Drawings.
- .2 All traverses will be closed and balanced. All level loops and traverses will be tied into the Control Monument Network.
- .3 Secondary Control Points will be tied into and relative to the Control Monument Network. Accuracy for Control Point surveys shall be to second order:
- .1 Horizontal shall be less than $r = 5(d+0.2)$ where "r" is in cm and "d" is in km.
- .2 Vertical shall be less than $0.008 \times k$ where k is distance in kilometres.
- .4 On request of Departmental Representative, the Contractor shall submit documentation to verify accuracy of field engineering work along with a certificate signed by the surveyor certifying those elevations and locations of completed Work conform to the Contract Documents.
- .6 Survey data for each payment line item in the unit price table and area of work shall be provided to the Departmental Representative as follows:
- .1 Digital csv files with the xyz data and an appropriate descriptor code as to the type of material surface or feature being surveyed.
- .2 Breaklines for all survey data in DXF file formation or another format pre-approved by the Departmental Representative.
- .3 A list of all point descriptors used in the survey data.
- .7 Where surveys of an item of work or location of work have been completed multiple times (e.g., multiple progress payments), compile individual survey point files into one complete survey file free of overlapping points and other inconsistencies resulting from the completion of individual surveys.



- .8 The Contractor shall complete detailed volume calculations using average end area determination or electronic surface to surface comparisons. Details of volume calculations shall be provided to the Departmental Representative for review upon request.
- .9 Surveys may be subject to verification by the Departmental Representative. The Departmental Representative may complete quality assurance construction survey measurements to verify grades and alignment, interim survey re-measurements for excavation limits and final neat line measurements to verify payment quantities for completed works. In case of discrepancy, the Departmental Representative's survey will govern.
 - .1 Should there be a discrepancy between the Contractor's survey and the Departmental Representative's quality assurance survey for the purpose of quantity verification, the Departmental Representative may complete cores to confirm thicknesses of material placed. The cost of completing such confirmatory cores will be borne by the Departmental Representative, unless cores confirm the Departmental Representative's position.
- .10 Preconstruction Survey:
 - .1 Submit Preconstruction Survey to the Departmental Representative prior to commencement of construction, in accordance with the following:
 - .1 The Contractor's Preconstruction Survey shall be completed when no snow is present at the site. If snow is present, the Contractor shall clear the snow prior to completing the Preconstruction Survey.
 - .2 At a minimum, the Contractor's Preconstruction Survey shall include:
 - .1 Existing ground surface within the existing cleared right-of-way (treeline to treeline), with survey points taken at 5 m intervals at 10 m stations. Reduce station interval as required to sufficiently characterize the ground surface in areas where there are changes in topography.
 - .2 Existing treeline / cleared vegetation line.
 - .3 Existing road crown / centreline, edges of gravel, and bottom of embankment slope, at 10 m stations. Reduce station interval as required to sufficiently characterize the existing road in areas where there are sudden changes in topography (i.e., at curb returns, culvert installations, etc.).
 - .4 Existing ditch line, with survey points taken at 10 m stations to sufficiently characterize the existing ditch profile / grade breaks. The Contractor shall identify areas with ponding water in the survey of the existing ditch line.
 - .5 Existing signs, drainage structures (i.e., culverts), and utility infrastructure (i.e., poles).
 - .6 Elevation check confirmation of control monumentation.
 - .7 Establishment of secondary control throughout the project.
 - .8 Georeferenced photograph log showing the site during the preconstruction survey.
 - .3 Submit the Preconstruction Survey to the Departmental Representative in a digital format conforming to this specification section and acceptable to the Departmental Representative. The Departmental Representative will review the survey for the purposes of validating the design. This shall include elevation check on the control



monumentation and establishing secondary control throughout the project. The Departmental Representative will provide the Contractor with revised design information (if required) within 15 working days of receipt the Contractor's Preconstruction survey.

- .4 The Contractor shall account review of the Preconstruction Survey and validation of the design by the Departmental Representative's in the Contractor's schedule.

PART 2 **PRODUCTS**

2.1 **NOT USED**

PART 3 **EXECUTION**

3.1 **NOT USED**

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Project Management and Coordination shall be incidental to the Contract and will not be measured for payment.

1.2 **PRE-CONSTRUCTION MEETING**

- .1 Following tender closing and prior to the construction start, attend in person or via teleconference a pre-construction meeting organized by the Departmental Representative.
- .2 Departmental Representatives and senior representatives of the Contractor, including but not necessarily limited to the Project Superintendent, Deputy Project Superintendent, Health and Safety Coordinator, Surveyor, Quality Control Manager, and Qualified Professional retained to complete Environmental Inspections, and major sub-contractors and sub-consultants shall attend in person or via teleconference.
- .3 The Departmental Representative shall establish a time, location, and teleconference number for the meeting and notify the Contractor a minimum of three (3) days prior to the meeting. The Contractor shall notify all concerned parties of the meeting.
- .4 The agenda is to include but is not limited to the following:
 - .1 Appointment of the official representative of participants in the work and lines of communication.
 - .2 Project schedule, proposed hours of work per day and number of working days per week.
 - .3 Contractor submissions (requirements and submissions schedule).
 - .4 Requirements for temporary facilities, site signage, offices, construction camp, storage sheds, utilities, and fences.
 - .5 Permitting and Environmental requirements.
 - .6 Site security in accordance with Section 01 52 00 – Construction Facilities and Equipment.
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
 - .8 Take-over procedures, acceptance, and warranties in accordance with Section 01 77 00 – Closeout Procedures.
 - .9 As-built drawings in accordance with Section 01 78 00 – Closeout Submittals.
 - .10 Monthly progress claims, administrative procedures, photographs, and holdbacks.
 - .11 Contractor's Quality Management and Quality Assurance undertaken by the Departmental Representative.
 - .12 Insurances and transcript of policies.
 - .13 Contractor's Project Specific Health and Safety Plan.
 - .14 Maintenance in accordance with Section 01 78 00 – Closeout Submittals.
 - .15 List of proposed suppliers, sub-contractors, and sub-consultants.
 - .16 Other business as required by the Departmental Representative or Contractor.



- .5 Within 14 calendar days of the pre-construction meeting, the Departmental Representative shall distribute meeting minutes to the Contractor. The Contractor shall review the meeting minutes and provide any comments within five (5) working days.

1.3 **ONSITE DOCUMENTS**

- .1 Maintain at job site, one (1) copy each of the following:
 - .1 “Issued for Construction” Contract Drawings (or “Issued for Tender” Contract Drawings if being used for construction).
 - .2 Contract Specifications.
 - .3 Addenda.
 - .4 Reviewed and accepted submittals.
 - .5 Change orders and other modifications to Contract.
 - .6 Copy of approved work schedule.
 - .7 Field test reports / records.
 - .8 Inspection certificates.
 - .9 Manufacturer’s certificates, and installation and application instructions (if applicable).
 - .10 Reviewed Shop Drawings, product data and samples.
 - .11 All permits (DFO, NWPA, and/or others as required for the project).
 - .12 Meeting minutes.
 - .13 Contractor’s Project Specific Health and Safety Plan.
 - .14 Contractor’s Environmental Construction Operations Plan (ECO Plan).
 - .15 Contractor’s Traffic Management Plan.
 - .16 Current construction standards of workmanship listed in the contract specifications.
 - .17 One (1) set of “Issued for Construction” Contract Drawings (or “Issued for Tender” if being used for construction), contract specifications, and Shop Drawings for as-built purposes.

1.4 **SCHEDULES**

- .1 Submit preliminary construction progress schedule in accordance with Section 01 32 16 – Construction Progress Schedules – Bar (Gantt) Chart to the Departmental Representative.
- .2 After review by Departmental Representative, revise project schedule to comply with comments given.
- .3 During progress of work, provide schedule with original tasks shown as the baseline and actual work progress updated with each submission (see Section 01 32 16 – Construction Progress Schedules – Bar (Gantt) Chart).

1.5 **CASH FLOW FORECASTING**

- .1 Provide detailed cash flow forecasting derived from the project schedule and the agreed upon project payment schedule (project unit prices). The cash flow forecast shall be broken out by line item to coincide with the project schedule. Submit cash flow forecast to the Departmental Representative within 14 calendar days after award of Contract but in all cases prior to starting onsite work.



- .2 Update project cash flow forecasting on a monthly basis or for each submission of a progress payment (whichever is more frequent) reflecting changes to the schedule until project completion. Submit updated forecast to the Departmental Representative.

1.6 CONSTRUCTION PROGRESS MEETINGS

- .1 During the course of work the Departmental Representative will schedule construction progress meetings approximately every week or every two (2) weeks.
- .2 Departmental Representatives and senior representatives of the Contractor, including but not necessarily limited to the Project Superintendent and major subcontractors shall attend in person. Other contractor representatives including but not necessarily limited to the Deputy Project Superintendent, Health and Safety Coordinator, Quality Control Manager, Surveyor, and Qualified Professional retained to complete Environmental Inspections shall attend in person or via teleconference.
- .3 The Departmental Representative shall establish a time, location, and teleconference number for the meeting and notify the Contractor a minimum of three (3) days prior to the meeting. The Contractor shall notify all concerned parties of the meeting.
- .4 Agenda to include the following:
 - .1 Review and approval of minutes of previous meeting.
 - .2 Health and Safety Incidents and concerns.
 - .3 Review of work progress since previous meeting.
 - .4 Field observations, problems, conflicts.
 - .5 Problems which impede construction schedule.
 - .6 Review of off-site fabrication delivery schedules (if applicable).
 - .7 Corrective measures and procedures to regain projected schedule.
 - .8 Revision to construction schedule and project submittals.
 - .9 Progress schedule, during succeeding work period.
 - .10 Review submittal schedules: expedite as required.
 - .11 Cash flow forecasting including monthly updates.
 - .12 Maintenance of quality standards.
 - .13 Review proposed changes for effect on construction schedule and on completion date.
 - .14 Other business.
- .5 Within 14 calendar days of the construction progress meeting, the Departmental Representative shall distribute meeting minutes to the Contractor. The Contractor shall review the meeting minutes and provide any comments within five (5) working days.

1.7 SUBMITTALS

- .1 Provide submittals, Shop Drawings, product data and samples in accordance with Section 01 33 00 – Submittal Procedures for review for compliance with Contract Documents, field dimensions and clearances, compatibility and available space, and for relation to work of other contracts. If requested, after receipt of Departmental Representative comments, revise and resubmit.
- .2 Submit requests for payment through the Departmental Representative via email or, if requested by the Departmental Representative or if desired by the Contractor, PSPC's 'Autodesk BIM 360' cloud-



based document filing system. Support claims for payment with survey data and other evidence as required by the Departmental Representative.

- .3 Submit Requests for Information (RFI) of Contract Documents and obtain instructions through Departmental Representative via PSPC's 'Autodesk BIM 360' cloud-based document filing system. If required by the Departmental Representative, provide supporting documents for proposed substitutions via PSPC's 'Autodesk BIM 360' cloud-based document filing system.
- .4 Process substitutions through Departmental Representative. If required by the Departmental Representative, provide supporting documents for proposed substitutions via PSPC's cloud-based document filing system.
- .5 Process change orders through Departmental Representative via PSPC's 'Autodesk BIM 360' cloud-based document filing system.
- .6 Deliver closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative via PSPC's 'Autodesk BIM 360' cloud-based document filing system.

1.8 CLOSE-OUT PROCEDURES

- .1 Close-out procedures as per Section 01 77 00 – Closeout Procedures.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Construction Progress Schedules shall be incidental to the Contract and will not be measured for payment.

1.2 **DEFINITIONS**

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

1.3 **PROJECT SCHEDULE**

- .1 Provide within 10 working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period required by Contract documents.
- .2 The Contractor shall provide the Departmental Representative with a minimum of (2) weeks notice prior to commencing work. Any change of this date requires a minimum of (1) week notice.
- .3 The Contractor shall make every effort to maintain the submitted work schedule and work commencement date.
- .4 The Contractor shall be responsible for all costs incurred by the Departmental Representative and his staff resultant from failure to comply with work schedule requirements.
- .5 Submit updated schedule with each Progress Payment Claim.
- .6 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.



- .7 Develop detailed Project Schedule conforming to the project completion dates found in Section 01 11 00 – Summary of Work and the Construction Staging requirements outlined in Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration.
- .8 Ensure detailed Project Schedule includes as a minimum, all relevant milestone activity types as follows:
 - .1 Project Award.
 - .2 Receipt of Necessary Permits.
 - .3 Submittal Schedule:
 - .1 Pre-construction survey.
 - .2 Environmental Construction Operations Plan (ECO Plan).
 - .3 Traffic Management Plan.
 - .4 Quality Management Plan.
 - .5 Project Specific Health and Safety Plan, including MSDS sheets.
 - .6 Hazardous Materials Management Plan.
 - .7 Shop Drawings and Product Samples (if applicable).
 - .8 As-built Survey and As-Built Drawing Mark ups.
 - .9 Test results.
 - .4 Mobilization.
 - .5 Work activities and material purchases by segment / locations (unless accepted otherwise, at a minimum each line item of work identified in the unit price table shall be identified separately on the project schedule).
 - .6 Interim inspections.
 - .7 Site Clean-up / Demobilization.
 - .8 Project Substantial Completion and Project Completion dates.
- .9 Indicate dates for submission, review time, resubmission time, and last date for meeting schedule.
- .10 Include dates when reviewed submittals will be required from the Departmental Representative.

1.4 SCHEDULE FORMAT

- .1 Prepare schedule in form of a horizontal Gantt bar chart.
- .2 Provide a separate bar for each item of work identified on the unit price table or if acceptable to the Departmental Representative, each operation.
- .3 Provide horizontal time scale identifying first workday of each week.
- .4 Format for listings: the chronological order of start of each item of work.
- .5 Include complete sequence of construction activities and identify critical path and critical path work items in identifying colour.
- .6 Include dates for commencement and completion of each major element of construction.

1.5 SUBMISSION OF SCHEDULES

- .1 Submit initial format of schedules within 14 calendar days after award of Contract, but in all cases prior to starting onsite work.



- .2 Submit schedules in electronic format via PSPC's 'Autodesk BIM 360' cloud-based document filing system. Provide schedules as a single PDF file format document (multiple files will not be accepted) and native file format (e.g., Microsoft Projects format) if requested by the Departmental Representative.
- .3 If requested submit two (2) hardcopies to be retained by the Departmental Representative.
- .4 The Departmental Representative will review the schedule and return any comments within 10 days after receipt.
- .5 Resubmit finalized schedule within seven (7) calendar days after receipt of Departmental Representative's review comments. Once accepted by the Departmental Representative, the accepted schedule shall form a baseline which all schedule updates shall be compared against.
- .6 Distribute copies of revised schedule to:
 - .1 The Contractor's team including Project Superintendent, Deputy Project Superintendent, and others as required.
 - .2 Subcontractors and Subconsultants.
 - .3 Other concerned parties.
- .7 Instruct recipients to report to Contractor within seven (7) calendar days any problems anticipated by timetable shown in the schedule.

1.6 PROJECT SCHEDULE REPORTING DURING THE WORK

- .1 Update project schedule on a monthly basis or with each progress payment (whichever is more frequent) reflecting activity changes and completions, as well as activities in progress.
- .2 Show changes occurring since previous submission of schedule:
 - .1 Major changes in scope.
 - .2 Activities modified since previous submission.
 - .3 Revised projections of progress and completion.
 - .4 Other identifiable changes.
- .3 Provide a narrative report to define:
 - .1 Problem areas, anticipated delays, and impact on schedule.
 - .2 Corrective action recommended and its effect.
 - .3 Effect of changes on schedules of other Prime Contractors.
- .4 Discuss project schedule at Construction Progress Meetings, identify activities that are behind schedule and provide measures to regain slippage. If requested by the Departmental Representative, provide a schedule recovery plan with details of the approach and changes the Contractor is planning on implementing to bring the project back on schedule.

PART 2 PRODUCTS

2.1 NOT USED



PART 3

EXECUTION

3.1

NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Submittal Procedures shall be incidental to the Contract and will not be measured for payment.

1.2 **GENERAL REQUIREMENTS**

- .1 Submit to the Departmental Representative submittals listed for review. Submit with reasonable promptness (per the timelines indicated, if applicable) and in an orderly sequence so as to not cause delay in work. Failure to submit in ample time is not considered sufficient reason for an extension of contract Substantial Completion Date, and no claim for extension by reason of such default will be allowed.
- .2 Unless specified otherwise or requested by the Departmental Representative, submittals shall be submitted to the Departmental Representative in electronic format via PSPC's 'Autodesk BIM 360' cloud-based document filing system. Each submittal shall be compiled into a single PDF document (multiple files will not be accepted).
- .3 The Departmental Representative will review the project submittals for accuracy against the appropriate project specifications and contract requirements, and endeavor to complete the reviews within the review time specified for each particular submittal. However, a longer review period may be required. If a longer review period is required, the Contractor will be notified prior to the passing of the specified review period. Upon completion of the submittal reviews by the Departmental Representative, comments and or acceptance of the submittals will be given. Upon review by the Departmental Representative, should comments be provided, the Contractor shall revise the submittal as required and re-submit the complete revised submittal back to the Departmental Representative for review within one (1) week (or within a time pre-approved by the Departmental Representative). The submittals will not be accepted until all comments from all reviews have been addressed to the satisfaction of the Departmental Representative. Despite acceptance of a particular submittal, the Departmental Representative reserves the right to provide additional comments to ensure the correction of any deficiencies with particular submittals at any time during the project.
- .4 Work affected by a submittal shall not proceed until the submittal is completed, reviewed, and accepted by the Departmental Representative.
- .5 Present all necessary drawings, Shop Drawings, product data, samples, and mock-ups in SI Metric units. Where items or information is not produced in SI Metric units, converted values are acceptable.
- .6 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 the requirements of work and Contract Documents. Submittals not stamped, signed, dated, and identified as to a specific project will be returned without being examined and shall be considered rejected.
- .7 Notify the Departmental Representative in writing at time of submission identifying deviations from requirements of Contract Documents and stating reasons for deviations.
- .8 Prior to any submission, verify field measurements and affected adjacent work included on the submission are coordinated.
- .9 Contractor's responsibility for errors and omissions in submission is not relieved by the Departmental Representative's review of submittals.



- .10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .11 Keep one (1) reviewed copy of each submission onsite.
- .12 Comments made from review of submittals are intended to ensure conformance with contract requirements and not intended to change contract price. If the Contractor feels the comments include requirements not required by the contract, the Contractor shall respond in writing to the Departmental Representative prior to undertaking the work.
- .13 The Contractor shall not construe the Departmental Representative's authorization of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Authorization of the programs shall not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal or Provincial regulations and 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.
- .14 The Departmental Representative may, at their sole discretion, withhold payment from the Contractor for Work until acceptable submittal documents have been provided by the Contractor to the Departmental Representative.

1.3 REQUIRED CONTRACTOR SUBMITTALS

- .1 Pre-Mobilization Submittals:
 - .1 The Contractor shall not begin any site Work or claim 50% Mobilization payment until the Departmental Representative has authorized acceptance of submittals in writing. Submit the following plans and programs to the Departmental Representative for review a minimum of 14 calendar days prior to mobilization to the project site:
 - .1 Project schedule, detailing the schedule of the workdays required from Contractor, Subcontractors and Subconsultants, and suppliers to complete each activity of the project by road segment or location in order to meet stages specified in Section 01 11 00 – Summary of Work. In addition, for each activity critical elements that could impact on the schedule are to be identified.
 - .2 List of subcontractors, subconsultants and suppliers, their role and their key personnel, including names and positions, addresses, telephone and/or cellular telephone numbers.
 - .3 Plan describing methods the Contractor will have to meet the responsibilities as the Prime Contractor for Traffic Control in the Work zone.
 - .4 Contractor Chain of Command, listing key Contractor personnel, including for each name, position, qualification, experience, telephone and/or cellular numbers. The list shall include the names and telephone / cellular number for contact persons who shall be available on a 24-hour basis in the event of emergencies.
 - .5 Work Plan, describing in detail for each activity by location, the Contractor's intended methods of construction, and materials, equipment and manpower the Contractor will use to meet stages specified in Section 01 11 00 – Summary of Work. The Work Plan must be linked to the Project Schedule.



- .6 Pre-Construction survey, detailing the existing conditions of the designated pit areas that shall be used for production and stockpiling.
- .7 Quality Management Plan in accordance with Section 01 45 00 – Quality Management.
- .8 Traffic Management Plan in accordance with the requirements of Section 01 35 00 –Traffic Management.
- .9 Environmental Construction Operations Plan (ECO Plan) that shall meet the requirements of Section 01 35 43 – Environmental Protection.
- .10 Site Access and Detour Plans. It shall include, but not be limited to, engineered Drawings and procedures for accessing all areas of the Work.
- .11 Management of Owner Supplied Materials Plan describing the Contractor's intended methods of reporting regularly on quantities used and for what purpose, and on managing materials supplied by the Owner to avoid waste or shortfalls.
- .12 Survey Plan describing the Contractor's intended methods of surveying during this project.
- .13 Contractor shall develop an "Emergency Procedures Protocol" in consultation with PSPC. PSPC will supply the Contractor with a template with contact names and numbers to be used for this purpose.
- .14 Project Specific Health and Safety Plan – The Contractor shall have a Certificate of Recognition (COR) or Registered Safety Plan (RSP) including a site-specific Health and Safety Plan acceptable to the Departmental Representative. The Contractor shall implement and maintain the Project Specific Health and Safety Plan during the Work. Project Specific Health and Safety Plan must include all elements identified in Section 01 35 33 – Health and Safety, Subsection 1.7 Project Specific Health and Safety Plan.
- .2 The Contractor shall not begin any site Work until the Departmental Representative has authorized acceptance of the submittals in writing.
- .2 Construction Phase Submittals:
 - .1 Weekly Progress Reports that outline the detailed Work (Contractor, subcontractors, subconsultants and suppliers) completed to date as well as the anticipated Work to be performed for the following week on a day-by-day basis. Work to be linked to activities by location identified in project schedule and to provide information on materials, equipment and manpower. Also, alternate Work to be identified if proposed Work or a portion thereof, cannot be done due to weather, equipment breakdown, delays in delivery, etc.
 - .2 Quality Control:
 - .1 Material Testing reports – The Contractor shall provide on a daily basis, material reports for review by the Departmental Representative.
 - .2 Inspection Reports - The Contractor shall maintain a daily inspection report that itemizes the results of all Quality Control inspections conducted by the Contractor. The reports shall be made available for review by the Departmental Representative upon request. A summary of all Quality Control inspections conducted to date shall be submitted by the Contractor with each request for payment.
- .3 Progress Photographs:



- .1 Formats: Electronic – jpg files, minimum three (3) megapixels.
- .2 Submission requirements: One (1) set of electronic files.
- .3 Identification: Name and number of project, description of photograph and date.
- .4 Submission Frequency: prior to commencement of Work and weekly thereafter with progress statement, or as directed by Construction Manager or Departmental Representative.
- .4 Survey data:
 - .1 Progress surveys to accompany progress payment submissions (see Section 01 29 00 – Payment Procedures).
- .5 Submit an electronic copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.
- .6 Submit copies of reports or directions issued by Federal and Territorial health and safety inspectors.
- .7 Submit copies of incident and accident reports.
- .3 Project Completion Submittals:
 - .1 Record Drawings - The Contractor shall submit copies of all Contractor's Drawings revised as necessary to record all as-built changes to the Work and the Contractor shall submit a set of Contract Drawings clearly marked to record as-built changes to the Work.
 - .1 Record Drawings to include all survey information and quantities (see Section 01 78 00 – Closeout Submittals).
 - .2 Quality Control Records – The Contractor shall submit a bound and itemized set of project quality control documentation.

1.4 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data that are to be provided by the Contractor to illustrate details of a portion of work.
- .2 Indicate materials, methods of construction, and attachment or anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of work or as indicated elsewhere in the specifications. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the section under which adjacent items will be supplied and installed. Indicate cross-references to design drawings and specifications.
- .3 Adjustments made on Shop Drawings by the Departmental Representative are not intended to change the Contract Price. Should the Contractor feel that the adjustments affect the value of work and are outside the contract requirements, the Contractor shall state such in writing to the Departmental Representative prior to proceeding with the work.
- .4 Make changes in Shop Drawings as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of any revisions other than those requested.
- .5 Accompany submissions with a transmittal letter, in duplicate, containing:



- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each Shop Drawing, product data, and sample.
- .5 Other pertinent data.
- .6 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by the Contractor's authorized representative certifying approval of submissions, verification of field measurements, and compliance with Contract Documents and requirements.
 - .5 Details of appropriate portions of work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Single line and schematic diagrams.
 - .9 Relationship to adjacent work.
 - .6 Professional seal and signature of the engineer certifying approval of the work (if required).
- .7 After the Departmental Representative's review and acceptance, distribute copies.
- .8 Submit an electronic copy of the Shop Drawing for each requested within the specification sections. Submit hard copies as requested by the Departmental Representative.
- .9 Submit electronic copies of product data sheets or brochures for requirements requested in specification sections and as requested by the Departmental Representative where Shop Drawings will not be prepared due to standardized manufacture of product.
- .10 Delete information not applicable to project.
- .11 Supplement standard information to provide details applicable to the project.
- .12 If upon review by the Departmental Representative no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of work may proceed. If Shop Drawings are rejected, noted copy will be returned. Resubmission of corrected Shop Drawings, through the same procedure as indicated above, must be performed before fabrication and installation of work may proceed.



- .13 The review of Shop Drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with general concept. This review shall not mean the Departmental Representative approves the detail design inherent in Shop Drawings. Responsibility for detail design of Shop Drawings shall remain with the Contractor, and as such, reviews by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in Shop Drawings, or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of work of all sub-trades.
- .14 Work affected by Shop Drawing shall not proceed until the Shop Drawing is reviewed and accepted by the Departmental Representative.

1.5 SAMPLES

- .1 Submit for review samples in duplicate, as requested in respective specification sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office or to a location as directed by the Departmental Representative.
- .3 Notify Departmental Representative in writing, at time of submission, of deviations in samples from requirements of Contract Documents.
- .4 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of work, state such in writing to Departmental Representative prior to proceeding with work.
- .5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.
- .7 Work affected by the sample shall not proceed until the sample is reviewed, and accepted by the Departmental Representative.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for the completion of Traffic Management shall be considered incidental to the applicable payment item of work in Section 01 45 00 – Quality Management.

1.2 **REFERENCES**

- .1 The Contractor shall provide traffic control in accordance with current edition of:
 - .1 Transportation Association of Canada (TAC):
 - .1 Manual of Uniform Traffic Control Devices for Canada (MUTCD).
 - .2 Government of Northwest Territories:
 - .1 Standard Specifications for Highway Construction.

1.3 **QUALITY CONTROL**

- .1 All Quality Control shall be performed by the Contractor.

1.4 **GENERAL**

- .1 The Contractor shall develop and implement a Traffic Management Plan (TMP) in accordance with Government of Northwest Territories Standard Specifications for Highway Construction (Latest Edition). The TMP will include plans for access points for the project. The TMP shall be submitted to the Departmental Representative in accordance with Section 01 33 00 – Submittal Procedures for review and acceptance prior to commencement of work.
- .2 The Contractor shall design, supply, erect, move and maintain all traffic control devices, signs, temporary pavement marking, other safety measures and provide staff to ensure safe passage of all traffic from commencement of site work to date of acceptance by the Departmental Representative.
- .3 All traffic and warning signs shall be either bilingual or of a symbolic or pictorial type. For all bilingual signs used, the English and French message shall be of equal letter size and at the same elevation, with English on left and French on right.
- .4 The Contractor shall coordinate traffic management procedures with other Contractors working in the area.

1.5 **PROTECTION OF PUBLIC TRAFFIC**

- .1 The Contractor shall comply with requirements of Acts, Regulations and By Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 Regardless of type of traffic control being used, maximum period of delay to public traffic shall be 15 minutes (cumulative). Emergency vehicles (i.e., ambulance, RCMP) must be granted immediate passage at all times. The Departmental Representative reserves the right to reduce delay time for public traffic at times when specified delay results in excessive backup of public traffic.
- .3 The Contractor shall provide competent, certified and properly equipped flag persons.



- .4 The Contractor shall also provide competent supervision and/or contract personnel as required during non-working hours to ensure that safety flares, flashing beacons, signs, lights, etc. are in proper working order.
- .5 The Departmental Representative will monitor the traffic control measures, and may require modifications of these measures from time to time to achieve satisfactory traffic flow, safety of traveling public and coordination with adjacent contracts.
- .6 The Contractor shall maintain a dust free construction zone by means of cleaning and watering when required or at the request of the Departmental Representative.
- .7 Traffic control measures will be monitored by the Departmental Representative, who may require modifications of these measures from time to time to achieve satisfactory traffic flow, safety of traveling public, and coordination with adjacent contracts.
- .8 Keep travelled way clean, free of potholes.
- .9 Keep areas clean and free of potholes, failures, and rutting.
- .10 Provide and maintain temporary markings, if required.

1.6 INFORMATIONAL AND WARNING DEVICES

- .1 The Contractor shall provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work that requires road user response.
- .2 The Contractor shall supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in the TMP submitted by the Contractor and approved by the Departmental Representative.
- .3 The Contractor shall supply, install and maintain two (2) portable Changeable Message Signs with a minimum of three (3) lines with eight (8) characters per line, for the duration of the project.
- .4 All signs and traffic control devices, barricades, etc. shall conform with the Transport Association of Canada (TAC) Manual of Uniform Traffic Control Devices for Canada (latest edition).
- .5 Signs shall be wind resistant.
- .6 As situations onsite change, the Contractor shall update their TMP outlining signs and other devices required for the project and submit for the approval of the Departmental Representative.
- .7 The Contractor shall continually inspect and maintain traffic control devices in use by:
 - .1 Checking signs daily for legibility, damage, suitability and location.
 - .2 Cleaning, repairing or replacing signs as required ensuring clarity and reflectance.
 - .3 Removing or covering signs that do not apply to conditions existing from day to day or time to time.

1.7 OPERATIONAL REQUIREMENTS

- .1 Maintain existing conditions for traffic throughout period of Contract except that, when required for construction under Contract and when measures have been taken as specified herein and accepted by Departmental Representative to protect and control public traffic.
- .2 Maintain existing conditions for traffic crossing right-of-way.



PART 2 **PRODUCTS**

2.1 **NOT USED**

PART 3 **EXECUTION**

3.1 **NOT USED**

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Environmental protection, including but not limited to the cost of preparing the Environmental Construction Operations Plan (ECO Plan) and the performance of all work necessary to ensure compliance with the applicable legislation, will be incidental to the Work and will not be paid separately.
- .2 Complying with all other licenses and permits shall be incidental to the contract and will not be measured separately for payment.
- .3 All costs associated with implementing and maintaining temporary and permanent environmental protection devices until the completion of construction will be considered incidental to the Work, and no separate or additional payment will be made.

1.2 **REFERENCES**

- .1 Government of Northwest Territories “Standard Specifications for Highway Construction” Department of Infrastructure – Latest Version.

1.3 **ENVIRONMENTAL LEGISLATION, REGULATIONS, APPROVALS, AND PERMITS**

- .1 The Contractor shall reference all applicable federal and territorial legislation and regulations concerning environmental protection and shall conduct their activities in accordance with such legislation and regulations, including, but not necessarily limited to the Northwest Territories Lands Act, the territorial Mackenzie Valley Resource Management Act, the territorial Waters Act, and the territorial Environmental Protection Act, the federal Fisheries Act, the federal Canadian Navigable Waters Act, the federal Migratory Birds Convention Act and the federal Species at Risk Act.
- .2 The Contractor shall comply with the conditions and requirements of all environmental approvals, permits, licenses and authorizations (Permits) issued for the project. If available at the time of bidding, Permits will be provided within the bid document. The Contractor shall obtain any further environmental Permits for their temporary works as may be required. The Contractor shall ensure that all workers onsite are aware of conditions and requirements all Permits issued for the project. Copies of Permits, and associated conditions and requirements, shall be posted on site for viewing by workers at the location that is visible and frequented by all workers.
- .3 The Contractor shall provide the Departmental Representative with written confirmation of their full compliance with all approvals, permits, licenses, written authorizations and management plans before the full amount of holdback will be released.
- .4 In the event of conflicting statements between the various Acts, Authorizations, Permits, and Codes of Practice, the more stringent requirement shall apply.

1.4 **ENVIRONMENTAL CONSTRUCTION OPERATIONS PLAN (ECO PLAN)**

- .1 The Contractor shall prepare and implement an Environmental Construction Operations Plan (ECO Plan) for the project, otherwise known as an Environmental Management Plan (EMP). The ECO Plan shall consist of written procedures and drawings (if required) that address the environmental protection issues relevant to the specific activities being performed and shall detail temporary environmental control measures that the Contractor proposes to undertake to comply with all



applicable legislation, regulations and approvals during the course of construction and during seasonal work interruptions.

- .2 The Contractor's ECO Plan shall be specific to the project. The Contractor shall ensure effective implementation of the ECO Plan by assigning responsibility for the implementation, and maintenance of temporary erosion control measures, wildlife monitor etc. to one (1) individual. The Contractor shall identify the individual responsible at the Preconstruction Meeting.
- .3 The ECO Plan shall not cover any permanent or long-term environmental or erosion control devices or work specified in the Contract.
- .4 The Contractor shall submit their ECO Plan to the Departmental Representative at least 14 calendar days prior to beginning of the work in each phase of the project. The Departmental Representative will review the ECO Plan and communicate any concerns to the Contractor within seven (7) calendar days after submission. The Contractor shall address any issues or concerns regarding the proposed ECO Plan to the satisfaction of the Departmental Representative prior to the commencement of the Work.
- .5 The finalization of the ECO Plan to the mutual satisfaction of the Departmental Representative and the Contractor does not constitute an approval or assurance from the Departmental Representative that the "temporary environmental control measures" detailed in the ECO Plan are sufficient to ensure compliance with all applicable legislation, regulations or conditions of approval. The Contractor is ultimately responsible to ensure all measures, used on the project, are sufficient to ensure compliance with all applicable authorities. This may mean increasing the number of installations, providing alternate devices or modifying procedures.
- .6 If at any time during the project it is determined that the devices or procedures detailed in the ECO Plan (any specific measures, locations or quantities proposed) are inappropriate or insufficient, the Departmental Representative will notify the Contractor in writing and Contractor shall modify the ECO Plan accordingly.
- .7 The Departmental Representative may suspend work in cases where in their opinion the Contractor fails to comply with procedures stated in the ECO Plan or does not comply with permit conditions or applicable legislation. In cases where the Contractor is not in conformance with its ECO Plan or is causing a significant adverse environmental impact, the Departmental Representative has the authority to order the immediate suspension of Work until the infraction is corrected in compliance with the applicable legislation and to the satisfaction of the Departmental Representative. Such orders will be made in writing. The costs of correcting an infraction of the ECO Plan as well as any costs associated with a Work suspension are the responsibility of the Contractor; and the Contractor will not have any claim for standby costs or a completion date extension resulting from such cases.

1.5 ENVIRONMENTAL PROTECTION DEVICES OR PROCEDURES

- .1 Temporary Environmental Protection Devices or Procedures:
 - .1 All other environmental protection or ESC devices or procedures required to ensure compliance with the Contract Documents, applicable legislation or regulations, and/or environmental approvals, permits, licenses and authorizations during construction are deemed to be necessary only as temporary environmental protection measures and must be the direct responsibility of the Contractor. This must include the responsibility for determining the quantities, nature and locations of such devices or procedures and the timing of each event. The Contractor will incorporate their proposed temporary



environmental protection devices or procedures, including their TESC plan in their ECO Plan.

- .2 No separate or additional payment will be made for any temporary environmental protection measures undertaken by the Contractor, with the exception that payment will be made for any temporary ESC device which the Departmental Representative directs to remain in place following the completion of construction.

.2 Maintenance of Environmental Protection Devices:

- .1 The Contractor must maintain all permanent ESC devices to the extent required for the Project and as directed by the Departmental Representative, up to completion of construction, including during periods of shutdown. This is particularly critical prior to adverse weather conditions or spring thaw.

1.6 ENVIRONMENTAL INSPECTIONS

- .1 Unless the Departmental Representative approves otherwise, the Contractor shall retain the services of a Qualified Professional, defined as an applied scientist or technologist who is registered and in good standing with an appropriate professional organization relevant to the specific project task (e.g., Professional Biologist) to conduct environmental inspections of the Work to evaluate compliance with the ECO Plan. The inspections will be conducted in conjunction with the Departmental Representative on a weekly basis, at a minimum, during construction and at the completion of the Work. The Contractor shall submit to the Department, within three (3) working days of each inspection, a report that includes the date, attendance, scope, observations, incidents of non-compliance, and actions taken as a result of the inspection to achieve compliance with the ECO Plan.

1.7 WASTE DISPOSAL

- .1 The Contractor shall not release, dump, spill or dispose of any substance(s) into the environment that causes or could cause impairment of or damage to the environment or human health or safety. The Contractor shall mitigate to ensure compliance with all regulatory legislation, any wastes arising from the Work and any other substance(s) that causes or could cause impairment of or damage to the environment or human health or safety, and should they fail to do so, the Departmental Representative may, without further notice, arrange the clean-up of such wastes and/or other substance(s) at the expense of the Contractor.
- .2 The Contractor shall remove and dispose of any inert solid waste materials resulting from the Work, prior to completion of the Work. The Contractor may temporarily store such material in interim stockpiles on the disturbed land, only if approved by the Departmental Representative. The Contractor shall not burn any waste oil or solid waste products, unless authorized in writing by an appropriate authority.

1.8 REPORTING PROCEDURES FOR SPILLS

- .1 In the event of the release of silt or other deleterious substance to the environment, the Contractor shall take all reasonable measures to contain the release and repair any damage. Any such Work shall be performed in accordance with the applicable legislation and regulations at the Contractor's expense. All the Work regarding the waste disposal and spill cleanup will not be measured separately for payment and shall be considered incidental to the Work. All Work shall be completed to the satisfaction of the Departmental Representative and meet the applicable regulatory requirements.



- .2 Spills or releases of deleterious substance, hazardous materials and/or any other substances that cause or could cause impairment of or damage to the environment or human health or safety shall also be immediately reported to the Departmental Representative and to the NWT 24-hour Spill Report Line (1-867-920-8130). The Contractor shall also complete a Spill Report Form and submit a copy to the appropriate regulatory bodies within 12 hours of a reported incident (Email: spills@gov.nt.ca; Fax: 1-867-873-6924).

1.9 WORK SUBJECT TO THE MIGRATORY BIRD CONVENTION ACT AND THE SPECIES AT RISK ACT

- .1 In order to comply with the federal Migratory Birds Convention Act and the federal Species at Risk Act in the event that vegetation clearing and/or other disturbances are necessary or likely to be required to carry out the Work, the Contractor must retain a Qualified Professional to assess the area requiring disturbance prior to clearing to determine the presence of nesting birds and sensitive or at-risk species. If the survey reveals the presence of any active nests, sensitive or at-risk species, the Contractor must incorporate into its ECO Plan any mitigation measures deemed necessary to ensure the Work is completed in a compliant manner. All costs associated with the survey will be considered incidental to the Work, and no separate or additional payment will be made.

1.10 ARCHAEOLOGICAL OR PALEONTOLOGICAL REMAINS

- .1 The Contractor's ECO Plan shall include a protocol for the encountering of archaeological or paleontological remains and materials. The Contractor shall be alert to archaeological or paleontological remains and materials that may be uncovered, which may be of significance in recording the historic and prehistoric past to preserve the culture and heritage of the NWT. When archaeological or paleontological remains are uncovered, the Contractor must immediately halt operations in the discovery location and notify the Departmental Representative. Every effort must be made to preserve archaeological or paleontological remains intact in their original positions in order to preserve the archaeological or paleontological importance of materials in relation to one another and to the enclosing soil.

1.11 CLIMATIC CONDITIONS

- .1 The Contractor's attention is drawn to the possible adverse climatic conditions at the location of the project. Information regarding climate conditions can be obtained from Environment Canada. PSPC will not be liable for any delays caused by adverse weather and no claims will be entertained for any increased costs whatsoever.

1.12 OTHER ENVIRONMENTAL MANAGEMENT CONSIDERATIONS

- .1 The Contractor shall conduct operations in such a manner that construction equipment does not leave the confines of flagged or designated right-of-way and pit limits without prior approval of the Departmental Representative. Environmentally sensitive areas adjacent to rights-of-way and pit limits shall be physically avoided.
- .2 The Contractor shall not operate heavy construction equipment in environmentally sensitive areas (e.g., streams, wetlands, muskeg) without prior written approval of the Departmental Representative.
- .3 Conduct culvert installations, removals and other instream activities only in dry or frozen conditions.
- .4 The Contractor shall note and avoid any Aboriginal settlement areas and asserted territories located in the vicinity of the work.



- .5 Land Use Regulations:
- .1 The contractor is responsible for obtaining the Km 251 Quarry Permits. The Contractor shall abide by all Terms and Conditions associated with these permits and the Land Use Regulations.
 - .2 The Contractor shall ensure that all workers on site are aware of all Terms and Conditions of Land Use and Quarry Permits. Copies of these Permits and the associated Terms and Conditions shall be posted on site for viewing by workers, at the location, that is accessible and frequented by all workers.
 - .3 The Contractor's attention is directed to "No Implied Obligations" (General Terms and Conditions, GC6) and is hereby advised they will be held fully responsible for all fines and penalties issued against the Department as Permittee under the Land Use Permit, and which resulted directly or indirectly from the Contractor's activities on the project.
 - .4 The Contractor's representative shall meet with the Departmental Representative and the Department of Lands' Resource Management Officer prior to commencement of any work under this Contract. The purpose of the meeting will be to review the Terms and Conditions of Land Use Permits, to identify areas of environmental concern, and to establish special procedures and precautions because of such concern.
- .6 Forest protection and fire fighting equipment:
- .1 The Contractor shall comply with the requirements for forest protection and firefighting equipment regulations as outlined in the Land Use Permit and the latest edition of the Forest Protection Act, Chapter 38 of the Revised Acts of the Northwest Territories.
 - .2 Firefighting equipment shall be stored in a conspicuous place and used exclusively for fire control. Caches should be appropriately signed.
 - .3 The supply of firefighting equipment and personnel will not be measured separately for payment and shall be considered incidental to the Work under the Contract.

PART 2 **PRODUCTS**

2.1 **NOT USED**

PART 3 **EXECUTION**

3.1 **NOT USED**

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for Health and Safety will not be made and shall be considered incidental to the applicable payment item of work.

1.2 **REFERENCES**

- .1 Government of Canada:
 - .1 Canada Labour Code – Part II as amended.
 - .2 Canada Occupational Health and Safety Regulations as amended.
- .2 National Building Code of Canada (NBC) as amended:
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.
- .3 Canadian Electrical Code (CE Code) as amended.
- .4 Canadian Standards Association (CSA) as amended:
 - .1 CSA Z797-2009 Code of Practice for Access Scaffold.
 - .2 CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
 - .3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
 - .4 CSA Z1006-10 Management of Work in Confined Spaces.
 - .5 CSA Z462-19 Workplace Electrical Safety Standard.
- .5 National Fire Code of Canada 2015 as amended:
 - .1 Part 5 – Hazardous Processes and Operations and Division B as applicable and required.
- .6 Fire Protection Engineering Services, HRSDC:
 - .1 FCC No. 301, Standard for Construction Operations.
 - .2 FCC No. 302, Standard for Welding and Cutting.
- .7 American National Standards Institute (ANSI):
 - .1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
- .8 Canadian Construction Association:
 - .1 COVID-19 Standardized Protocols for All Canadian Construction Sites (latest edition).
- .9 Workers' Safety and Compensation Commission (WSCC):
 - .1 WSCC Construction and COVID-19 Safety.

1.3 **DEFINITIONS**

- .1 Hot Work: Includes cutting / melting with use of a torch, flame, or other open flame devices and grinding equipment which produces a spark.
- .2 Workplace: As defined by Workers' Safety and Compensation Commission (WSCC) Occupational Health and Safety Guidelines. The project shall be considered as having separate workplaces should the WSCC Occupational Health and Safety Guidelines – Location Factors provide "Yes" to



“Indication of Separate Workplaces” including but not limited to “Locations of one employer are more than 20 minutes apart from each other”.

1.4 WORKERS' COMPENSATION COVERAGE

- .1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.
- .2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.5 COMPLIANCE WITH REGULATIONS

- .1 PSPC may terminate the Contract without liability to PSPC where the Contractor, in the opinion of PSPC, does not comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.6 SUBMITTALS

- .1 The Contractor's Project Specific Health and Safety Plan shall be submitted to the Departmental Representative as a single PDF document (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the plan (first submission and if required all subsequent re-submissions) within 14 calendar days of submission. Upon review of the plan the Departmental Representative will do one of the following:
 - .1 Accept the plan.
 - .2 Accept portions of the plan and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan for review.
 - .3 Reject the plan and provide comments outlining required changes or additional information needed before the plan will be reviewed in detail. Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan for review.
- .2 Submit the following to the Departmental Representative in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures:
 - .1 Copies of reports or directions issued by Federal and Territorial health and safety inspectors.
 - .2 Copies of incident and accident reports.
 - .3 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .4 Emergency Procedures.
 - .5 Medical surveillance: Where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.



- .6 If requested, complete versions of the Contractor's corporate Health and Safety Policies / Procedures manual.
- .3 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.
- .4 Work affected by the submittal (as determined by the Departmental Representative) shall not proceed until acceptance of the submittal by the Departmental Representative.
- .5 The Contractor shall submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.
- .6 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .7 The Contractor shall submit copies of reports or directions issued by Federal and Provincial / Territorial health and safety inspectors.
 - .1 The Contractor shall submit copies of incident and accident reports.
 - .2 The Contractor shall submit copies of Material Safety Data Sheets (MSDS) to Departmental Representative.

1.7 PROJECT SPECIFIC HEALTH AND SAFETY PLAN

- .1 The Contractor shall prepare and comply with the Project Specific Health and Safety Plan. The preparation and details of the Project Specific Health and Safety Plan shall include conducting a site-specific hazard assessment based on review of Contract Documents, required work, and project site(s). The Project Specific Health and Safety Plan shall address all concerns / requirements identified in the Contract Documents, and identify any known and potential health risks and safety hazards.
- .2 The Contractor shall submit a Project Specific Health and Safety Plan: Within 14 calendar days after date of Notice to Proceed and prior to commencement of Work. Project Specific Health and Safety Plan shall include:
 - .1 Contractor's safety policy / statement.
 - .2 Identification of applicable compliance obligations.
 - .3 Identification of personnel and alternates responsible for project site safety and health. List of health and safety responsibilities for all personnel listed.
 - .4 Definition of responsibilities for project safety / organization chart for project.
 - .5 General safety rules for project and actions which will be taken by the Contractor should these safety rules be broken by the any workers on the project (includes workers employed by the General Contractor, Sub-Contractor, or Sub-Consultants).
 - .6 Identification of health and safety risks / hazards and engineering and administrative control measures to be implemented at each "workplace" for managing identified risks / hazards, including:
 - .1 Summary of health risks and safety hazards resulting from hazard assessment analysis, with respect to site tasks and operations which must be performed as part of the work and hazard rating assignment (low, moderate, or high) for each "workplace", as defined by WSCC Occupational Health and Safety Regulations.



- .2 List hazardous materials to be brought on site as required by the work.
- .3 Job-specific safe work procedures that are not already included in the Contractor's corporate Health and Safety Policies / Procedures manual.
- .4 Identify personal protective equipment (PPE) to be used by workers.
- .5 Identify personnel training requirements and training plan, including site orientation for new workers and personnel designated by the Departmental Representative as needing to visit the site.
- .6 Identification of the first aid requirements for each "workplace" on the project including:
 - .1 Estimated travel time from the "workplace" to the nearest hospital.
 - .2 Maximum numbers of workers at any time per "workplace".
 - .3 The first aid supplies, equipment, and facilities which will be available at each "workplace".
 - .4 The first aid attendant certificate level onsite at each "workplace".
 - .5 The first aid transportation which will be used on the project (i.e., Emergency Transport Vehicle [ETV]), if required by Contractor or WSCC requirements. Details of where the ETV will be located / parked relative to the location of the first aid attendant(s) during the work.
- .7 Inspection policy and procedures.
- .8 Incident reporting and investigation policy and procedures.
- .9 Occupational Health and Safety Committee / Representative procedures.
- .10 Occupational Health and Safety meetings.
- .11 Occupational Health and Safety communications and record keeping procedures.
- .12 Emergency contact information, including PSPC project personnel (including Consultants), Contractor office and field staff, fire, police, ambulance, air ambulance, and forest fire reporting.
- .13 Identify employee training plans for wildlife encounters and prevention.
- .14 Identify fire safety, fire reporting, and fire evacuation procedures.
- .15 Confirmation through the review and signatures from the Contractor's Project Manager, Superintendent, Health and Safety Manager, Quality Control Manager, representatives from all major Sub-Contractor's, and other project roles that may be applicable, that they have reviewed the Project Specific Health and Safety plan, agree with its contents, and will be enforced by them for the duration of the project.
- .16 Blank copy of Contractor's daily toolbox meeting form.
- .17 Blank copy of the Contractor's Site Safety Orientation Form.
- .18 Blank copy of the Contractor's Incident / Accident Report template.
- .19 Resume(s) or certification(s) of Health and Safety Coordinator(s) responsible for site safety and onsite First Aid Attendants.
- .20 Maps identifying the location of the nearest hospital(s) to the project site. The maps shall be of appropriate scale and sufficient detail allowing for their use to navigate to the hospital(s) in the event of an emergency.
- .21 Address standard operating procedures to be implemented during emergency situations through an on-site Contingency and Emergency Response Plan.



- .22 Develop the Project Specific Health and Safety Plan in collaboration with all Sub-Contractors. Ensure that work / activities of Sub-Contractors are included in the hazard assessment, and are reflected in the Project Specific Health and Safety Plan.
- .3 The Departmental Representative will review the Contractor's Project Specific Health and Safety Plan and provide comments to the Contractor within 10 days after receipt of the plan. The Contractor shall revise the plan as appropriate and resubmit to the Departmental Representative within five (5) days after receipt of comments from the Departmental Representative.
- .4 Submission of the Project Specific Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:
 - .1 Relieve the Contractor of responsibility for errors or omissions.
 - .2 Relieve the Contractor of their responsibility for meeting all requirements of construction and the Contract Documents.
 - .3 Be construed to imply approval by the Departmental Representative.
 - .4 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
 - .5 Relieve the Contractor of their legal obligations for the provision of health and safety on the project.
 - .6 Relive the Contractor of Occupational Health and Safety Prime Contractor responsibilities.
- .5 Should health and safety requirements change throughout the project and require information not included in the Project Specific Health and Safety Plan, revise and update Project Specific Health and Safety Plan as required and re-submit to the Departmental Representative.
- .6 Should deficiencies in the Contractor's Project Specific Health and Safety Plan be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the Project Specific Health and Safety Plan to ensure the correction of any deficiencies.
- .7 Contractor's COVID-19 Safe Work plan, describing the protocols and procedures the Contractor shall implement throughout the duration of the work to mitigate the spread and risk of exposure to COVID-19, in accordance with Federal and Territorial COVID-19 guidelines, and Canadian Construction Association.
- .8 Should Federal and/or Territorial guidelines change during the project, the Contractor shall update the Project Specific Health and Safety Plan and the Contractor's COVID-19 Safe Work Plan accordingly and submit to the Departmental Representative for review and acceptance.

1.8

CONTRACTOR'S RESPONSIBILITY

- .1 Assume responsibility as the Prime Contractor for work under this Contract.
- .2 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.
- .3 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 Project Specific Health and Safety Plan.
- .4 The protection of persons off-site and the environment such that they may be affected by the conduct of the work.



1.9 HEALTH AND SAFETY COORDINATOR

- .1 Employ and assign to work, a competent and authorized representative as Health and Safety Coordinator. The Health and Safety Coordinator shall:
 - .1 Be responsible for completing all health and safety training, site orientations, and ensuring personnel who do not successfully complete the required training are not permitted to enter the site to perform work.
 - .2 Be responsible for implementing, enforcing, and monitoring the Project Specific Health and Safety Plan.
 - .3 Be on site during execution of critical elements of the work or as required by the Contractor.
 - .4 Have a minimum of two (2) years' site-related working experience specific to activities associated with Construction.
 - .5 Have working knowledge of occupational safety and health regulations.
 - .6 Attend pre-construction and construction progress meetings as required, or as requested by the Departmental Representative.

1.10 GENERAL

- .1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
- .2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
 - .1 Provide appropriate means by use of barricades, fences, warning signs, traffic control persons, and temporary lighting as required.
 - .2 Secure site during non-work hours at nighttime or provide security guard as deemed necessary to protect site against entry.
- .3 Conduct daily safety meetings and task specific meetings (toolbox) as required by special work. At a minimum, meetings shall include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Keep records of meetings and post to PSPC's 'Autodesk BIM 360' cloud-based document filing system on a weekly or more frequent basis.
- .4 Design and construct falsework in accordance with CSA S269.1-1975 (R2003) as amended.
- .5 Carry out work in confined spaces in accordance with current regulations.
- .6 Use powder-actuated devices in accordance with ANSI A10.3 (as amended) only after receipt of written permission from the Departmental Representative.

1.11 PROJECT / SITE CONDITIONS

- .1 Work at the site will, at a minimum, involve contact with:
 - .1 Utilities / energized electrical services.
 - .2 General public (including large transport trucks) and PSPC maintenance personnel travelling the highway.
 - .3 Local wildlife.
 - .4 Unpredictable and adverse weather conditions.



- .5 Working from heights.

1.12 REGULATORY REQUIREMENTS

- .1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.
- .2 In event of conflict between any provisions of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

1.13 WORK PERMITS

- .1 Obtain specialty permit(s) related to project before start of work.

1.14 FILING OF NOTICE

- .1 The Contractor is to complete and submit an Advance Notice of Project as required by the Worker's Compensation Board and any other authority in effect at the place or work.
- .2 Provide copies of all notices to the Departmental Representative.

1.15 EMERGENCY PROCEDURES

- .1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e., names / telephone numbers) of:
 - .1 Designated personnel from Contractor's company.
 - .2 Regulatory agencies applicable to work and as per legislated regulations.
 - .3 Local emergency resources.
 - .4 Departmental Representative.
- .2 Include the following provisions in the emergency procedures:
 - .1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
 - .2 Evacuate all workers safely.
 - .3 Check and confirm the safe evacuation of all workers.
 - .4 Notify the fire department or other emergency responders.
 - .5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
 - .6 Notify Departmental Representative.
- .3 Provide written rescue / evacuation procedures as required for, but not limited to:
 - .1 Work at high angles.
 - .2 Work in confined spaces or where there is a risk of entrapment.
 - .3 Work with hazardous substances.
 - .4 Underground work.
 - .5 Work on, over, under and adjacent to water.
 - .6 Workplaces where there are persons who require physical assistance to be moved.
 - .7 Work in areas where sudden movement of native or placed materials may occur.



- .4 Design and mark emergency exit routes to provide quick and unimpeded exit.
- .5 Emergency drills must be held at least once each year for all projects lasting longer than one year. The purpose of these drills is to ensure awareness and effectiveness of emergency exit routes and procedures. A record of the drills must be kept by the Contractor.
- .6 Revise and update emergency procedures as required and re-submit to the Departmental Representative.

1.16 HAZARDOUS PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canadian Labour Code.
- .2 Where use of hazardous and toxic products cannot be avoided:
 - .1 Advise Departmental Representative beforehand of the product(s) intended for use. If requested, submit applicable MSDS and WHMIS documents as per Section 01 33 00 – Submittal Procedures. Keep documents available for review on the project site as close as practical to where the hazardous and toxic product is being used.
 - .2 Provide adequate means of ventilation acceptable to the Departmental Representative and suitable for the hazard.
 - .3 The Contractor shall ensure that the product is applied as per manufacturers' recommendations, and ensure only pre-approved products are brought onto the work site in an adequate quantity to complete the work.
- .3 All asbestos-containing materials are prohibited from use and shall not be incorporated into the work by the Contractor.

1.17 ELECTRICAL SAFETY REQUIREMENTS

- .1 Comply with authorities and ensure that, when installing new facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.
 - .1 Before undertaking any work, coordinate arc flash protection, required energizing and de-energizing of new and existing circuits with the Departmental Representative.
 - .2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

1.18 ELECTRICAL LOCKOUT

- .1 Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.
- .2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request / authorization form. The Contractor shall have electrical lockout procedures available for review upon request by the Departmental Representative.
- .3 Keep the documents and lockout tags at the site and list in a logbook for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.



1.19 OVERLOADING

- .1 While undertaking the work, ensure no part of the work or infrastructure is subject to a load which will endanger its safety or will cause permanent deformation.

1.20 HOT WORK AND FIRE SAFETY REQUIREMENTS

- .1 Obtain Departmental Representative's authorization before undertaking any welding, cutting or other hot work operations on site. If requested by the Departmental Representative, provide hot works permits for any hot works activities.
- .2 Store oily / paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
- .4 Obtain approval from the Departmental Representative prior to bringing any portable gas and/or diesel fuel tanks on site.

1.21 UNFORESEEN HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.
- .2 Should contaminated site conditions be encountered when completing the work, refer to GC4.4 – Contaminated Site Conditions for procedures which the Contractor shall undertake.

1.22 POSTED DOCUMENTS

- .1 Post legible versions of the following documents onsite:
 - .1 Project Specific Health and Safety Plan.
 - .2 Sequence of work.
 - .3 Emergency procedures.
 - .4 Corporate Health and Safety Policies and Procedures manual(s).
 - .5 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshaling station, and the emergency transportation provisions.
 - .6 Notice of Project.
 - .7 Floor plans or site plans.
 - .8 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
 - .9 Workplace Hazardous Materials Information System (WHMIS) documents.
 - .10 Material Safety Data Sheets (MSDS).
 - .11 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
- .2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.



- .3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

1.23 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
- .3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

1.24 MEDICAL

- .1 Provide and maintain first aid facilities for all workers as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .2 Provide the appropriate first aid kit, based on the number of workers, in accordance with the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .3 Establish an emergency response plan acceptable to Departmental Representative, for the removal of any injured person to medical facilities or a doctor's care in accordance with applicable legislative and regulatory requirements.
- .4 Provide proof of First Aid credentials to Departmental Representative prior to the start of construction. Provide the appropriate number of first aid attendants on site in accordance with Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .5 Emergency and First Aid Equipment:
 - .1 Locate and maintain emergency and first aid equipment in appropriate location onsite including first aid kit to accommodate number of site personnel; portable emergency eye wash; fire protection equipment as required by legislation.
 - .2 Locate sufficient blankets and towels, stretcher, and one (1) handheld emergency siren in all confined access locations.
 - .3 Provide a minimum of one (1) qualified first aid attendant, as per Workers' Compensation Act or the Occupational Health and Safety Regulations onsite at all times when Work activities are in progress; duties of first aid attendant may be shared with other light duty Work related activities.

1.25 ACCIDENTS AND ACCIDENT REPORTS

- .1 Immediately report, verbally followed by a written report within 24 hours, to Departmental Representative, all accidents of any sort arising out of or in connection with the performance of the Work, giving full details and statements of witnesses. If death or serious injuries or damages are caused, report the accident promptly to Departmental Representative by telephone in addition to any report required under Federal and Provincial laws and regulations.
- .2 If a claim is made by anyone against Contractor or Sub-Contractor on account of any accident, promptly report the facts in writing to Departmental Representative, giving full details of the claim.



1.26 COVID-19

- .1 Contractor's COVID-19 Safe Work plan, describing the protocols and procedures the Contractor shall implement throughout the duration of the work to mitigate the spread and risk of exposure to COVID-19, in accordance with Federal and Territorial COVID-19 guidelines and Canadian Construction Association.
- .2 The Contractor shall keep informed with the latest Federal and Provincial recommendations and protocols regarding COVID-19 at all times during construction and shall modify their construction approach accordingly to ensure adherence to these recommendations and protocols.
- .3 If Federal and/or Territorial recommendations require that the project work be stopped, the Contractor shall consult with the Departmental Representative and the Departmental Representative will advise as to the course of action the Contractor shall take.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **REFERENCES AND CODES**

- .1 Current National Building Code of Canada (NBC) including all amendments up to tender closing date.
- .2 Perform Work in accordance with National Building Code of Canada (NBC), latest edition, National Fire Code of Canada (NFC), latest edition, and Northwest Territories Codes including all amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .3 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.2 **FEES, PERMITS AND CERTIFICATES**

- .1 Submit applications to and provide authorities having jurisdiction with information requested.
- .2 Pay fees and obtain certificates and permits required.
- .3 Furnish certificates and permits.

1.3 **CONSTRUCTION SAFETY MEASURES**

- .1 Without restricting other provisions or requirements of the Contract, observe construction safety measures of National Building Code 1995 Part 8, Provincial Government or Territorial Government, Workers' Compensation Board and municipal authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.
- .2 Comply with requirements of FCC No. 301.
- .3 Provide fire extinguishers necessary to protect the work in progress and the Contractor's physical plant on site. Do not use specified permanent fire extinguishers for this purpose.

1.4 **FALSEWORK**

- .1 Design and construct falsework in accordance with CSA S269.1.
- .2 All Falsework to be designed and approved by a Professional Engineer registered or licensed in Northwest Territories.

1.5 **WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)**

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.
- .2 Deliver copies of WHMIS data sheets to Departmental Representative on delivery of materials.

1.6 **BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions.



1.7 TAXES

- .1 Pay applicable Federal, Provincial or Territorial and Municipal taxes.

1.8 EXAMINATION

- .1 Examine existing conditions and determine conditions affecting work.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for Quality Management and Traffic Management will be made on the basis of the Price per Unit Bid for **“Quality Management and Traffic Management”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for the preparation of and adherence to the Contractor's Quality Management Plan including Quality Control, completion of traffic management, including preparation of a Traffic Management Plan, installation of signage, traffic flaggers, traffic flaggers (if required), temporary concrete barriers and privacy fence (if required), detours (if required), snow removal to facilitate access to and completion of the work, and all other items necessary for successful completion of the work.
- .2 Measurement for Payment for Quality Management and Traffic Management will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative, provided all of the associated Quality Management / Quality Control and Traffic Management requirements have been achieved with respect to check sheets, testing frequency, documentation, reporting, staffing, etc.

1.2 **REFERENCE STANDARDS**

- .1 Government of Northwest Territories Standard Specifications for Highway Construction (latest edition).
- .2 Alberta Transportation Testing (ATT):
 - .1 ATT 58/96, Control Strip Method.
- .3 American Society for Testing and Materials (ASTM), latest edition.
 - .1 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .2 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM D5519, Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials.
 - .4 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .5 ASTM C117, Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .6 ASTM D5821, Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.
 - .7 ASTM D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 - .8 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
 - .9 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - .10 ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.



- .11 ASTM D2419, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

1.3 DEFINITIONS

- .1 Quality Control (QC): The process of checking specific product or services to determine if they comply with the contract documents and relevant quality standards and identifying ways to eliminate causes of unsatisfactory product or service performance.
- .2 Quality Assurance (QA): The process of ensuring that the Contractor's Quality Management Plan (QMP) (QC, non-conformances, etc.) are being followed. The results of the QA are provided as feedback to the QC team. Where required the Contractor shall implement changes to the project based on the feedback received from the QA process.
- .3 Quality Management Plan (QMP): The complete details of the Contractor's plans and processes to ensure quality on the project.
- .4 Deficiency / Non-conformance: Work or product failing to meet the conditions or requirements of the contract (general conditions, specifications, drawings, or other section(s) forming the project contract).
- .5 Frozen Conditions: applies when the material or air temperature is less than or equal to zero degrees Celsius (0°C).
- .6 Unfrozen Conditions: applies when the material or air temperature is greater than zero degrees Celsius (0°C).

1.4 RESPONSIBILITIES

- .1 The quality management responsibilities for this project are as follows:
 - .1 Quality Control: The Contractor's responsibility.
 - .2 Quality Assurance: The Departmental Representative's responsibility.
 - .3 Quality Management Plan: Prepared by the Contractor.
 - .4 Non-conformance Report: Prepared by the Contractor's Quality Control Manager in conjunction with the Contractor, and/or if necessary prepared by the Departmental Representative.

1.5 GENERAL

- .1 The Contractor shall be responsible for ensuring the product meets the contractual quality requirements and that Quality Control measuring and documenting the quality of the work is completed by qualified personnel independent from the Contractor's organization. Quality Control work includes monitoring, inspecting, testing, and documenting the means, methods, materials, workmanship, processes and products of all aspects of the work as necessary to ensure conformance with the Contract.
- .2 The Contractor shall provide unrestricted access to all Quality Control operations and documentation produced by or on behalf of the Contractor and shall allow the Departmental Representative full access at any time during working hours.
- .3 The Departmental Representative will review the Contractor's performance of the work and determine the acceptability of the work based on the Departmental Representative's Quality Assurance results and, where deemed appropriate by the Departmental Representative,



supplemented by the Contractor's Quality Control results. If needed, the Departmental Representative may request further testing.

- .4 Work failing to meet the conditions of the Contract shall be considered a non-conformance. A Non-Conformance Report (NCR) will then be issued by the Contractor's Quality Control Manager. Non-conforming work shall be removed / replaced from the work unless an exception to the contract documents is accepted by the Departmental Representative.
- .5 The Contractor shall not be entitled to payment for work that lacks the appropriate Quality Control documentation, verified by the Quality Control Manager, as required by the Contract or is subject to an unresolved NCR.
- .6 The Contractor shall implement a well-coordinated approach to all operations related to the work and will organize its team and operations in keeping with the goal of doing things right the first time.

1.6 SUBMITTALS

- .1 Quality Management Plan:
 - .1 The Contractor's Quality Management Plan shall be submitted to the Departmental Representative as a single PDF document (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the plan (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan the Departmental Representative will do one of the following:
 - .1 Accept the plan.
 - .2 Accept portions of the plan and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, re-submit the complete plan for review.
 - .3 Reject the plan and provide comments outlining required changes or additional information needed before the plan will be reviewed in detail. Following completion of edits by the Contractor, re-submit the complete plan for review.
 - .2 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.
 - .3 No work shall be undertaken on any element of Project Work (including payments, incidental work, or submittals for review) for which the applicable portions of the Quality Management Plan have not been accepted by the Departmental Representative.
 - .4 The review of the Quality Management Plan by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in the accepted Quality Management Plan or of responsibility for meeting all requirements of the Contract Documents.
 - .5 Should deficiencies in the Contractor's Quality Management Plan be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the Quality Management Plan to ensure the correction of any deficiencies.
- .2 Check sheets, daily Quality Control reports, NCR's, test results, and other documents and forms prepared as part of the Quality Management Plan and completed throughout the project to verify conformance with the contract requirements shall be distributed to the Departmental Representative



in electronic format via PSPC's 'Autodesk BIM 360' cloud-based document filing system within 24 hours of the completion. Submit to the Departmental Representative hardcopies of the same documents, forms, and test results if requested.

1.7 QUALITY MANAGEMENT PLAN

- .1 The Contractor shall prepare a Quality Management Plan. The purpose of the plan is to ensure the performance of the work in accordance with Contract requirements.
- .2 The Quality Management Plan is required to cover the work in its entirety, including without limitation all materials the Contractor and Subcontractors are supplying, monitoring and testing of the construction, documentation, and all items and phases of construction on the Project. At a minimum this shall include:
 - .1 Testing and Survey (including minimum frequencies) to be completed by the Contractor (e.g., compaction, gradation, and tolerances of the work completed).
 - .2 Procedures for verifying and documenting conformance of the work to the contract requirements including but not limited to review of the work and completion of check sheets and daily reports.
- .3 The Quality Management Plan shall include the following information:
 - .1 The name and qualifications of the Quality Control Staff / Manager and their assigned roles and work scheduling in performing Quality Control duties.
 - .2 The name of Quality Control testing personnel (and agency, if being subcontracted) and survey personnel (and agency, if being subcontracted), and details of their qualifications and relevant experience to provide the specific services required for the Project.
 - .3 A list of testing and survey equipment to be used for the work.
- .4 The Contractor shall ensure that all workers are familiar with the Quality Management Plan, its goals, and their role under it, as well as the Contract Specifications associated with the work they are to undertake.

1.8 QUALITY CONTROL PERSONNEL

- .1 The Contractor shall appoint qualified and experienced Quality Control Personnel (Quality Control Manager and Quality Control Staff as necessary to complete required Quality Control workload), who are dedicated to quality matters, and work for an engineering consulting company which is owned and operated independently from the Contractor's organization. The Quality Control Manager and Quality Control Staff will report regularly to the Contractor's management and report on the Contractor's conformance with the quality requirements on the project.
- .2 The Contractor shall designate one (1) person as the Quality Control Manager and if needed one (1) person as the designate replacement Quality Control Manager (when the Quality Control Manager is offsite on a break) who shall be responsible for the implementation of the Contractor's Quality Management Plan. The Quality Control Manager shall be a qualified Professional Engineer, Certified Engineering Technician, or Applied Science Technologist, or other person with knowledge, skills and abilities acceptable to the Departmental Representative.
- .3 The Quality Control Manager, or a designated replacement Quality Control Manager, shall remain on site at all times the Contractor is performing work which must be tested or inspected in-process and must be readily accessible and able to return when off-site. Unless preapproved by the Departmental Representative, the Quality Control Manager shall only be replaced by the designate



replacement Quality Control Manager during scheduled breaks as outlined in the Contractor's Quality Management Plan.

- .4 At a minimum the Quality Control Manager shall:
 - .1 Be responsible to measure conformance of the work with the contract requirements and ensure that quality is not being compromised by production measures.
 - .2 Be empowered by the Contractor to resolve Quality Control matters.
 - .3 Direct and monitor Quality Control work completed by Quality Control testing agencies and Quality Control Staff.
 - .4 Review, sign, and be responsible for all reports (material and testing results).
 - .5 Immediately notify the Contractor's management so work can be stopped and corrective action taken when material, product, processes or submittals are deficient or non-compliant with the contract requirements.
 - .6 Complete internal Non-conformance Reports (NCR's).
 - .7 Respond to NCR's issued by the Departmental Representative.
 - .8 Attend pre-construction and construction progress meetings.
- .5 PSPC reserves the right to reject one (1) or more of the Contractor's Quality Control Personnel and require the Contractor to find alternative Quality Control Personnel prior to or during the work should the Quality Control Personnel not have the necessary qualifications as listed in this specification or, in the opinion of the Departmental Representative, is not adequately fulfilling the quality control requirements or independently reporting on the Contractor's conformance with the quality requirements on the project.

The Departmental Representative and PSPC project team will regularly review the Quality Control Personnel throughout the project to assess whether the Quality Control Personnel are providing the quality control services as required by this specification.

Should Quality Control Personnel be rejected by the Departmental Representative, any work which cannot undergo complete quality control as outlined in these specifications shall stop while the Contractor finds replacement Quality Control Personnel. Payment for Quality Management may be withheld at the discretion of the Departmental Representative should any concerns with Quality Control Personnel be identified.

1.9 CHECK SHEETS

- .1 Check sheets to verify and document conformance of the work to the quality requirements of the contract are fundamental to the Quality Control process. The check sheets prepared as part of the Quality Management Plan shall include all components of the project work and all checks required to ensure the components of the work are completed in conformance with the requirements of the Contract Documents. The check sheets shall be prepared assuming the Departmental Representative will only be providing spot checks of the work throughout the project and thus Quality Control Personnel shall check all elements of the work for conformance with the requirements of the Contract Documents. Where the Contract Documents provide a requirement but then also indicate that the Departmental Representative may also accept an alternative (e.g., "as approved by the Departmental Representative"), the check sheets shall assume that the requirement listed governs and the Quality Control process shall check these requirements unless directed otherwise during the project by the Departmental Representative.



- .2 The frequency of check sheets completed by the Quality Control Staff to verify and document conformance of the work to the quality requirements of the contract shall be established by the Quality Control Manager to ensure the quality of the work is thoroughly documented. At a minimum, the frequency of check sheets shall achieve the following:
 - .1 Daily (relative to the work being performed).
- .3 All check sheets shall be reviewed and signed by the Quality Control Manager prior to submission to the Departmental Representative.

1.10 DAILY QUALITY CONTROL REPORTS

- .1 Daily Quality Control Reports shall be completed by the Quality Control Manager each day work is being completed requiring Quality Control.
- .2 The Daily Quality Control Reports shall include a list of the Quality Control activities completed that day (e.g., check sheets and tests) and note any concerns with respect to quality, all non-conformances identified by the Quality Control Personnel (even when immediately corrected by the Contractor), and all Non-conformance Reports issued by the Quality Control Manager.
- .3 The Daily Quality Control Report shall include photos of any Quality Control concerns or non-conformances identified by the Quality Control Personnel.
- .4 All Daily Quality Control Reports shall be reviewed and signed by the Quality Control Manager prior to submission to the Departmental Representative.

1.11 QC TESTING

- .1 QC testing and survey inspection required to provide Quality Control to assure that the work strictly complies with the Contract requirements shall be completed by the Contractor as follows:
 - .1 The Contractor shall be responsible for all survey control, quantity control and quality control testing.
 - .2 Retain and utilize Professional Survey / Engineering Services licensed to operate in the Northwest Territories to carry out all surveying, quality control and quality control testing requirements for this Contract.
 - .3 Include all testing and survey inspection specified in the Contract Documents.
 - .4 Any other testing or survey inspection required as a condition for deviation from the specified Contract procedures.
- .2 The frequency of testing / survey inspections shall be outlined in the Quality Management Plan. At a minimum the Contractor shall achieve the most stringent Quality Control testing / survey inspection frequencies as follows:
 - .1 The specific frequencies defined elsewhere in these specifications.
 - .2 The minimum QC testing / survey inspection frequencies as defined in Table 01 45 00 – 01.
- .3 Unless otherwise specified or as directed by the Departmental Representative, the latest edition of ASTM test methods shall be used.



Table 01 45 00 – 01: Minimum QC Testing Inspection Frequencies		
Activity	Test / Survey Inspection	Frequency
Manufacture – Surfacing Gravel, Sub-Base Gravel, Embankment	ASTM C136, Dry Sieve Analysis of Aggregates	The more stringent of four (4) tests per lot or one (1) test for every two (2) hours of manufacturing
	ASTM C117, Sieve Analysis of Aggregates by Washing	One (1) test per shift
	ASTM D2419, Sand Equivalent	One (1) test per aggregate source
	ASTM C131, Los Angeles degranulation	One (1) test per aggregate source
	ASTM D5821, Fractured Faces Method “A”	One (1) test per shift
	ASTM D4318, Plasticity	One (1) test per aggregate source
	ASTM D4791, Flat and elongated particles	One (1) test per shift
Manufacture / Screening / Sorting – Riprap	ASTM D5519, Particle Size Analysis of Natural and Man-Made Riprap Materials	One (1) Test per every one (1) day of production
Placement / Site Tolerance – Culvert Bedding and Surround Material	Survey Inspection	One (1) point every 3 m ² of material placed
Placement / Site Tolerance – Surfacing Gravel	Survey Inspection	Final lift, three (3) points along each cross section at 10 m stations
Placement / Site Tolerance – Sub-Base Gravel	Survey Inspection	Final lift, three (3) points along each cross section at 20 m stations
Placement / Site Tolerance – Ponding Area Infill (Sub-Base Gravel)	Survey Inspection	One (1) point at each end of the ponding area infilled, and intermediate points every 5 m (where required)
Placement / Site Tolerance – Ditch Blocks (Sub-Base Gravel)	Survey Inspection	Final lift, one (1) point on the top and at each end of the Ditch Block (total of two [2] points per Ditch Block)
Placement / Site Tolerance – Embankment	Survey Inspection	Final lift, two (2) points along each cross section at 20 m stations
Placement / Site Tolerance – Riprap	Survey Inspection	The more stringent of six (6) survey point for each culvert riprap end treatment, or one (1) point for every 5 m ² of placed Riprap or design change in design grade of placed Riprap
Placement / Site Tolerance – Culverts	Survey Inspection	One (1) survey point (invert or crown of culvert) every 5 m length of culvert section installed
Placement / Site Tolerance – Security Gates	Survey Inspection	One (1) survey point at each post location (total of two [2] points per gate)
Placement / Site Tolerance – Traffic Signs	Survey Inspection	One (1) survey point at each traffic sign installation



Compaction – Surfacing Gravel, Sub-Base Gravel, Embankment (unfrozen conditions)	Maximum Density (ASTM D698)	The more stringent of: <ul style="list-style-type: none">- One (1) test per gravel pit / material source- One (1) test for any change in nature or source of material within a gravel pit
Compaction – Surfacing Gravel, Sub-Base Gravel, Embankment (unfrozen conditions)	In-Place Density (ASTM D6938)	Three (3) randomly located tests over the full width of material placed every 20 m station, per each lift of material placed
Compaction – Surfacing Gravel, Sub-Base Gravel, Embankment, Culvert Bedding and Surround Material (frozen conditions)	Control Strip Method (ATT 58/96)	The more stringent of: <ul style="list-style-type: none">- One (1) test per gravel pit / material source- One (1) test for any change in nature or source of material within a gravel pit- One (1) test for every freeze-thaw cycle during compaction
Compaction – Culvert Bedding and Surround Material (unfrozen conditions)	In-Place Density (ASTM D6938)	One (1) randomly located test for every 4 m of culvert section installed per each lift of material placed
Moisture Content – Surfacing Gravel, Sub-Base Gravel, Embankment, Culvert Bedding and Surround Material (frozen conditions)	Moisture Content (ASTM D2216)	The more stringent of two (2) tests per source or as required by the Departmental Representative should a change in the material properties be detected

- .4 Quality Control testing agencies, their inspectors, and their representatives are not authorized to revoke, alter, relax, or release any requirement of the Contract Documents, nor to approve or accept any part of the work.
- .5 The Contractor shall complete testing in the following manner:
 - .1 Provide testing facilities and personnel for the tests and inform the Departmental Representative in advance to enable the Departmental Representative to witness the tests if so desired.
 - .2 Notify the Departmental Representative when sampling will be conducted.
 - .3 Submit the test results to the Departmental Representative in accordance with Item 1.6 – Submittals of this specification section.
 - .4 Identify test reports with the name and address of the organization performing all tests, and the date of the tests.
 - .5 Immediately after completion of tests, provide all test results on Contractor-supplied forms acceptable to the Departmental Representative.
 - .6 Initiate other Quality Control tests or procedures as necessary for ensuring production of a quality product and include them in the Quality Control Plan. Tests or procedures may also be introduced after the start of work as necessary as amendments to the Quality Control Plan.



1.12 NON-CONFORMANCE REPORTS

- .1 The Contractor shall, and the Departmental Representative may, review the work to determine conformance with the contract requirements.
- .2 Should the Contractor's Quality Control reporting indicate that the work, product, or methodology is not in conformance with the contract requirements (including the Contractor's submitted plans [Project Specific Health and Safety Plan, Traffic Management Plan, ECO Plan, Quality Management Plan, etc.]), the Quality Control Manager shall:
 - .1 Inform the Contractor of the deficiency. The Contractor shall then take appropriate action to correct the deficiency.
 - .2 Ensure that the action taken by the Contractor corrected the deficiency and any substandard product was eliminated from the work. If the deficiency was not immediately corrected and substandard product remains or becomes part of the work, an internal Non-Conformance Report (NCR) shall be prepared by the Quality Control Manager and issued to the Contractor within 24 hours of the occurrence, with a copy to the Departmental Representative in accordance with Item 1.6 – Submittals of this specification section. Included as part of the NCR will be a required response time.

The Contractor shall then respond to the NCR (within the specified response time) by notifying the Quality Control Manager and the Departmental Representative of the proposed resolutions and corrective actions. The Contractor and/or the Quality Control Manager may consult with the Departmental Representative on the resolutions but is not required to do so.

Payment for the work for which the NCR has been issued may be withheld until the NCR issue is resolved.
- .3 Should the Contractor's Quality Control reporting indicate that an aspect of the Contractor's work is continually deficient (starting with the second similar occurrence) and not in conformance with the contract requirements (including the Contractor's submitted plans [Project Specific Health and Safety Plan, Traffic Management Plan, ECO Plan, Quality Control Plan, etc.]), the Quality Control Manager shall issue an internal procedural Non-Conformance Report (NCR) to the Contractor within 24 hours of the occurrence, with a copy to the Departmental Representative in accordance with Item 1.6 – Submittals of this specification section. Included as part of the NCR will be a required response time.
 - .1 The Contractor shall then respond to the NCR (within the specified response time) by notifying the Quality Control Manager and the Departmental Representative of the proposed resolutions and corrective actions. The Contractor and/or the Quality Control Manager may consult with the Departmental Representative on the resolutions but is not required to do so.
 - .2 Payment for the work for which the NCR has been issued may be withheld until the NCR issue is resolved.
- .4 Should the Departmental Representative's Quality Assurance reporting indicate that the work is not in conformance with the Contract requirements, the Departmental Representative may issue to the Contractor an NCR with a required response time or direct the Quality Control Manager to prepare an NCR.
 - .1 The Contractor shall then respond to that NCR, within the specified response time, with proposed resolutions and corrective actions. The Departmental Representative will accept or reject the proposed resolution and corrective action proposal. If the proposed resolution



- is rejected by the Departmental Representative, the Contractor shall resubmit with an alternative response until a solution acceptable to the Departmental Representative is found.
- .2 Quality Assurance testing and inspection may be performed by the Departmental Representative to determine if the corrective action has provided an acceptable product. Acceptance and rejection will continue until the Departmental Representative determines that a quality product has been achieved. Quality
- .3 Payment for the work for which the NCR has been issued may be withheld until the NCR issue is resolved.
- .5 Should the Departmental Representative find that any component of the Contractor's submitted plans (Project Specific Health and Safety Plan, Traffic Management Plan, ECO Plan, Quality Control Plan, etc.) are not being adhered to by the Contractor or any member of the Contractor's team, the Departmental Representative may issue an NCR to the Contractor.
- .1 Payment for the work for which the NCR has been used may be withheld until the NCR issue is resolved.
- .6 If in the opinion of the Departmental Representative it is not viable to correct non-conforming work or work not performed in accordance with Contract Documents, the Departmental Representative may deduct from the Contract Price the difference in value between work performed and that called for by Contract Documents, the amount of which shall be determined by the Departmental Representative.

1.13 DEPARTMENTAL REPRESENTATIVE INSPECTION AND AUDITS

- .1 The Departmental Representative may perform quality assurance audits as desired. Such audits will not relax the responsibility of the Contractor to perform work in accordance with Contract Documents.
- .2 Allow the Departmental Representative access to work. If part of the work is in preparation at locations other than the place of work, allow access to such work whenever it is in progress.
- .3 If Contractor covers, or permits to be covered, work that has been designated for Quality Assurance testing, inspections, or approvals before such is made, uncover such work, have inspections or tests satisfactorily completed, and make good such work.
- .4 Independent Inspection / Testing Agencies may be engaged by the Departmental Representative for the purpose of Quality Assurance inspection and/or testing portions of the work. Costs of such services will be borne by the Departmental Representative.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1

GENERAL

1.1 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Payment for temporary utilities will not be made and shall be considered incidental to the contract.

1.2 INSTALLATION AND REMOVAL

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

1.3 WATER

- .1 Contractor shall supply water to successfully complete the work, including but not limited to water required for achieving material moisture content and as required for the site office trailer.

1.4 DEWATERING

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

1.5 TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be flameless (vent free) type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:



- .1 Conform with applicable codes and standards.
- .2 Enforce safe practices.
- .3 Prevent abuse of services.
- .4 Prevent damage to finishes.
- .5 Vent direct-fired combustion units to outside.
- .6 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.6 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on Site.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for Construction Facilities and Equipment will not be made and shall be considered incidental to the applicable payment item of work.

1.2 **INSTALLATION AND REMOVAL**

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

1.3 **SCAFFOLDING**

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
 - .1 Submit drawings stamped and signed by Professional Engineer registered or licensed in Northwest Territories.
- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs as necessary to carry out work.

1.4 **HOISTING**

- .1 Provide, operate, and maintain hoists and cranes as necessary for moving of workers, materials, and equipment.
- .2 Hoists and cranes shall be operated by qualified operators.

1.5 **SITE STORAGE / LOADING**

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

1.6 **EQUIPMENT, TOOL, AND MATERIALS STORAGE**

- .1 If required by the Contractor 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 public.

1.7 **SANITARY FACILITIES**

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



1.8 CONSTRUCTION SIGNAGE

- .1 No other signs or advertisements, other than those required by Section 01 35 00 – Traffic Management, are permitted on site.

1.9 CONSTRUCTION LAYDOWN AREA, CONSTRUCTION PARKING, AND SITE OFFICE

- .1 Confine construction laydown areas, site office locations, and construction parking to the locations identified below in compliance with Section 01 35 43 – Environmental Protection and as pre-approved by the Departmental Representative.
 - .1 GNWT Pit km 251 Quarry Site.
 - .2 ISSF Old Borrow Site (Town Pit).
 - .3 Maintenance Gravel Stockpile Location at the North Leg Terminus.
 - .4 Other areas as preapproved by the Departmental Representative.

1.10 DEPARTMENTAL REPRESENTATIVE'S OFFICE TRAILER

- .1 Provide the Departmental Representative with office space within the Contractor's trailer or a standalone office trailer setup at a location pre-approved by the Departmental Representative.
- .2 The office space within the Contractor's Trailer or standalone office trailer shall be:
 - .1 A minimum of 3.0 m long × 3.0 m wide × 2.4 m high, with floor 0.3 m above grade.
 - .2 Insulation and heating system to maintain 22 degrees Celsius (22°C) inside temperature at -10 degrees Celsius (-10°C) outside temperature.
 - .3 Equip office with 1 m × 2 m table, and two (2) chairs.
 - .4 Install electrical lighting system to provide minimum 750 lx using surface mounted, shielded commercial fixtures with 10% upward light component.
 - .5 Power for the onsite trailer shall be available at all times when work at the site is ongoing by means of a generator or connection to power utility, supplied and maintained by the Contractor, or by other hook-ups as accepted by the Departmental Representative.
- .3 If requested by the Departmental Representative, the Contractor shall move the Departmental Representative's standalone office trailer during the project a maximum of two (2) times. Any costs associated with this relocation of the Departmental Representative's Office Trailer is the responsibility of the Contractor. The new location will be directed by the Departmental Representative on or near the project site.

1.11 POWER

- .1 Provide and pay for power as required for the completion of the works and operations of construction offices.

1.12 COMMUNICATIONS

- .1 Ensure Contractor's onsite representatives have suitable onsite phone communications allowing the Departmental Representative reliable communication to the Contractor's onsite representative when onsite.



1.13 TEMPORARY HEATING, VENTILATION, AND LIGHTING

- .1 Provide temporary heating, ventilation, and lighting as required during construction period to facilitate construction of the works.

1.14 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of work.

1.15 CONSTRUCTION EQUIPMENT

- .1 Prior to commencement of construction and periodically throughout the work and whenever requested by the Departmental Representative, provide a detailed list of all construction equipment used on the project (including sub-contractor's equipment). The list shall be as per the format of the General Contractor & Sub-Contractor Construction Equipment List found in Appendix C of these specifications. The list shall include the size, make, model, and year of manufacture of all equipment, and shall include all equipment used on the project site, including trucks for hauling material.
- .2 The Departmental Representative has the right to request additional equipment be brought to site should the work appear to be delayed due to lack of equipment.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1

GENERAL

1.1 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Payment for Temporary Barrier and Enclosures will not be made and shall be considered incidental to the applicable payment item of work.

1.2 INSTALLATION AND REMOVAL

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

1.3 HOARDING

- .1 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures (see Section 01 35 43 – Environmental Protection for more information).

1.4 GUIDERAILS AND BARRICADES

- .1 Provide secure, rigid guiderails and barricades around deep excavations and open shafts.
- .2 Provide as required by governing authorities.

1.5 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.6 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag persons, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the Public.

1.7 FIRE ROUTES

- .1 Maintain access to property for use by emergency response vehicles.

1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.9 PROTECTION OF STRUCTURE FINISHES

- .1 Provide protection for finished and partially finished structure finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers and hoardings.
- .3 Confirm with Departmental Representative locations and installation schedule three (3) days prior to installation.



PART 2 **PRODUCTS**

2.1 **NOT USED**

PART 3 **EXECUTION**

3.1 **NOT USED**

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for Construction Camp will not be made and shall be considered incidental to the applicable payment item of work.

1.2 **GENERAL REQUIREMENTS**

- .1 The Contractor shall provide its own construction camp as necessary. Obtain approval from landowner should Contractor choose to setup construction camp. The construction camp shall not be located within any land owned or leased by PSPC or NRCan.
- .2 The Contractor shall be responsible for all utility services to the construction camp. The construction camp to be established and operated in accordance with local regulations.

1.3 **REQUIREMENTS OF REGULATORY AGENCIES**

- .1 Obtain necessary licenses and approvals required by Authorities having Jurisdiction for authorized use of water and disposal of domestic sewage and other waste.
- .2 Comply with Environmental regulations.

PART 2 **PRODUCTS**

2.1 **NOT USED**

PART 3 **EXECUTION**

3.1 **MOBILIZATION**

- .1 Mobilize equipment, personnel, and materials as necessary to establish temporary construction camp and offices. Obtain necessary licenses and approvals from Authorities having Jurisdiction prior to mobilization. Camp and service area location and layout plan to be submitted to Departmental Representative for review and acceptance.
- .2 Temporary construction camps to be established and operated in accordance with local regulations.

3.2 **MAINTENANCE**

- .1 Maintain construction camp and offices in a neat and tidy condition.

3.3 **DEMOBILIZATION**

- .1 Upon vacating the construction camp, offices and temporary services, clean-up and leave site in a condition satisfactory to the Departmental Representative and the Authorities having Jurisdiction.

END OF SECTION



PART 1 **GENERAL**

1.1 **REFERENCES**

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .4 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non conformance.

1.2 **QUALITY MANAGEMENT**

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

1.3 **STORAGE, HANDLING AND PROTECTION**

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



- .7 Touch up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original, unless described otherwise in these specifications. Do not paint over name plates.

1.4 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

1.5 MANUFACTURER'S INSTRUCTIONS

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

1.6 QUALITY OF WORK

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

1.7 COORDINATION

- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Cleaning shall be incidental to contract and will not be measured for payment.

1.2 **PROJECT CLEANLINESS**

- .1 Maintain the Work area in a tidy condition, free from accumulation of waste products and debris, including that caused by the Owner, Departmental Representative, or other Contractors / Subcontractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. No burning of waste materials on site is permitted.
- .3 Clear snow and ice from areas of work during active construction periods and when access to environmental protection devices or facilities is required outside active construction times.
- .4 Remove waste material and debris offsite at regularly scheduled time or dispose of as directed by the Departmental Representative. Make arrangements with and obtain permits from Authorities having Jurisdiction for disposal of waste and debris.
- .5 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .6 Provide adequate ventilation during use of volatile or noxious substances.
- .7 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .8 Complete work site cleaning and ensure worker hygiene practices are in accordance with the Contractor's COVID-19 Safe Work Plan.

1.3 **FINAL CLEANING**

- .1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products, debris, and materials used in construction. Reinstall the work site to the conditions pre-existing and to the satisfaction of the Departmental Representative.
- .3 Inspect finishes and ensure specified workmanship and operation.
- .4 Remove dirt and other disfiguration from exterior surfaces.
- .5 Sweep and wash clean paved or Bituminous Surface Treatment (BST) finished areas.
- .6 Ensure machinery, tools and equipment are cleaned as required.

PART 2 **PRODUCTS**

2.1 **NOT USED**



PART 3

EXECUTION

3.1

NOT USED

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Closeout Procedures shall be incidental to contract and will not be measured for payment.

1.2 **SUBSTANTIAL PERFORMANCE**

- .1 Project “Substantial Performance” shall be attained through the following process:
 - .1 When the project work has achieved Substantial Performance as defined by GC1.1.4, the Contractor and all Subcontractors shall conduct an inspection of work, identify deficiencies and defects and repairs as required to conform to Contract Documents. Correct deficiencies and defects and complete repairs identified.
 - .2 Notify the Departmental Representative in writing of completion of the Contractor’s Inspection, correction of deficiencies, defects, and repairs, and request the Departmental Representative’s Substantial Performance inspection.
 - .3 Upon request from the Contractor, the Departmental Representative will complete a Substantial Performance inspection. If requested by the Departmental Representative, the Contractor shall accompany Departmental Representative during the Substantial Performance inspection.
 - .4 Unless stated otherwise by the Departmental Representative, the Contractor shall correct all deficiencies, defects, and repairs identified during the Substantial Performance inspection by the Departmental Representative prior to the preparation of the “Certificate of Substantial Performance”.
 - .5 Should the Departmental Representative determine that Substantial Performance as defined by GC1.1.4 has been achieved, the Contractor shall prepare a “Request for Progress Payment” with the final project quantities and all Progress Payment submissions as outlined in Section 01 29 00 – Payment Procedures. The Departmental Representative will use the submitted “Request for Progress Payment” to prepare a “Certificate of Substantial Performance” in accordance with GC5.5.
 - .6 Should the “Certificate of Substantial Performance” include remaining defects, faults, and incomplete work etc., the Contractor shall provide to the Departmental Representative a schedule for the completion / correction of each remaining defect, fault, and incomplete work etc. The “Certificate of Substantial Performance” will not be processed for payment until the Contractor’s schedule has been provided, reviewed and accepted by the Departmental Representative. The Contractor’s schedule shall be provided in writing as follows:
 - .1 Include the completion / correction dates for all items of defects, faults, incomplete work etc. identified by the Departmental Representative.
 - .2 Be provided in a letter with the Contractor’s company letterhead and be signed by an authorized representative of the Contractor.

1.3 **COMPLETION**

- .1 The project shall be deemed to have reached “Completion” when all requirements of GC1.1.5 have been achieved. The “Certificate of Completion” shall then be prepared by the Departmental Representative in accordance with GC5.6.



PART 2 **PRODUCTS**

2.1 **NOT USED**

PART 3 **EXECUTION**

3.1 **NOT USED**

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Closeout Submittals shall be incidental to contract and will not be measured for payment.

1.2 **SUBMITTALS**

- .1 Submit the following for Departmental Representative review. Following each review, the submission will be returned with the Departmental Representative's comments. The Contractor shall revise and re-submit the submittal(s) per the comments provided.
- .2 Provide the following submissions to the Departmental Representative within two (2) weeks of substantial performance:
 - .1 As-built Drawings and Shop Drawing mark-ups.
 - .2 As-built survey.

1.3 **RECORDING AS-BUILT CONDITIONS (AS BUILT DRAWINGS)**

- .1 The Contractor shall be responsible for printing one (1) set of hardcopy "Issued for Construction" drawings (or one [1] set of hardcopy "Issued for Tender" drawings if being used for construction) to record as-built conditions and submit at the completion of the project as the "As-built Drawings".
- .2 Record information concurrently with construction progress on the "Issued for Construction" (or "Issued for Tender") drawings. Do not conceal work until the required information is recorded.
- .3 Legibly mark each item on the "Issued for Construction" (or "Issued for Tender") drawings and Shop Drawings in red ink to record actual construction conditions and any changes made by addenda and change orders.
- .4 Maintain record documents in clean, dry, and legible condition.
- .5 Keep record documents available for inspection by the Departmental Representative.
- .6 Submit to the Departmental Representative one (1) copy of "Issued for Construction" (or "Issued for Tender") drawings which have been marked up by the Contractor to include all "as-built" conditions.

1.4 **AS-BUILT SURVEY**

- .1 At the completion of the work complete an as-built survey of the works. At a minimum the survey shall include:
 - .1 Topography of all areas disturbed and modified during construction, including Embankment, Surfacing Gravel, Sub-Base Gravel.
 - .2 Culverts, including inverts at inlet and outlet, size and type.
 - .3 Riprap.
 - .4 Nonwoven Geotextile.
 - .5 Signage (new or modified).
 - .6 Security Gates.
 - .7 Any other feature or elements of work incorporated into the project.
- .2 The As-Built Survey shall include sufficient point density to adequately characterize the work. Survey methods and point density is subject to prior approval of the Departmental Representative. At a



minimum, the Contractor shall survey all features at 20 m station intervals and the location of all treatment boundaries including changes in material type / placement, changes in surface treatment, and changes in terrain.

- .3 Survey data shall be collected at an accuracy of +/- 0.020 m horizontal and +/- 0.020 m vertical or better and shall be referenced / tie into PSPC's monument / coordinate system as shown on the Contract Drawings.
- .4 The following files shall comprise the as-built survey provided to the Departmental Representative:
 - .1 Digital csv file with the xyz data and an appropriate descriptor code as to the type of material, surface or feature being surveyed.
 - .2 Breaklines for all survey data in DXF file formation or another format pre-approved by the Departmental Representative.
 - .3 A list of all point descriptors used in the survey data.

PART 2 **PRODUCTS**

2.1 **NOT USED**

PART 3 **EXECUTION**

3.1 **NOT USED**

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for Hazardous Materials will not be made and shall be considered incidental to the work.

1.2 **DEFINITIONS**

- .1 Dangerous Goods: Product, substance, or organism that is specifically listed or meets the hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2 Hazardous Material: Product, substance, or organism that is used for its original purpose and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3 Hazardous Waste: Any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment, or disposal.
- .4 Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by a combination of federal and provincial laws.

1.3 **SUBMITTALS**

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
- .2 If requested by the Departmental Representative, submit to the Departmental Representative a current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.
- .3 If requested by the Departmental Representative, submit Hazardous Materials Management Plan to the Departmental Representative that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

1.4 **STORAGE AND HANDLING**

- .1 Abide by internal requirements for labeling and storage of materials and wastes. If required coordinate storage of hazardous materials with the Departmental Representative.
- .2 Store and handle hazardous materials and waste in accordance with applicable federal and provincial or territorial laws, regulations, codes, and guidelines.
- .3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.
- .4 Store all flammable and combustible liquids in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval.
- .5 Transfer of flammable and combustible liquids is prohibited within buildings.
- .6 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.



- .7 Flammable liquids having a flash point below 38°C, such as naphtha or gasoline, will not be used as solvents or cleaning agents.
- .8 Store flammable and combustible waste liquids for disposal in approved containers located in a safe, ventilated area. Keep quantities to a minimum.
- .9 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.
- .10 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 L for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers that are in good condition.
 - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
 - .4 Segregate incompatible materials and wastes.
 - .5 Ensure that different hazardous materials or hazardous wastes are not mixed.
 - .6 Store hazardous materials and wastes in a secure storage area with controlled access.
 - .7 Maintain a clear egress from storage area.
 - .8 Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.
 - .9 Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.
 - .10 Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .11 Ensure personnel have been trained in accordance with WHMIS requirements.
- .12 Report spills or accidents involving hazardous materials immediately to the Provincial Emergency Program 24-hour phone line at 1-800-663-3456, other local authority having jurisdiction, and the Departmental Representative. Submit a written spill report to the Departmental Representative within 24 hours of incident.
- .13 Store and handle all hazardous materials away from any water course as outlined in Section 01 35 43 – Environmental Protection.

1.5 TRANSPORTATION

- .1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable territorial regulations.
- .2 If exporting hazardous waste to another country, ensure compliance with federal Export and Import of Hazardous Waste Regulations.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Only bring on site the quantity of hazardous materials required to perform work.



- .2 Maintain MSDS in proximity to where the materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

PART 3 **EXECUTION**

3.1 **DISPOSAL**

- .1 Dispose of hazardous waste materials in accordance with applicable federal and territorial acts, regulations, and guidelines. Costs for disposal to be considered incidental to the work.
- .2 Recycle hazardous wastes for which there is an approved, cost-effective recycling process available.
- .3 Send hazardous wastes only to authorized hazardous waste disposal or treatment facilities.
- .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
- .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
- .6 Dispose of hazardous wastes in a timely fashion in accordance with applicable provincial regulations.

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for removal and disposal of existing Security Gates and supply and installation of new Security Gates will be made on the basis of the Lump Sum under **“Security Gate (Remove, Dispose, Supply, Install)”** in the Bid and Acceptance Form. The Lump Sum Price shall include all costs for excavation, removal, and offsite disposal of the existing security gate, preparation of shop drawings, supply and installation of the new security gate and associated componentry, supply and installation of steel pipe piles as described in the contract drawings, supply and placement of riprap boulders, and all other items necessary for the successful completion of the work.
- .2 Measurement for Payment for Security Gates removal and reinstallation will be made by Lump Sum based on the percentage of work completed and accepted by the Departmental Representative.
- .3 Payment for the supply and installation of new traffic signs will be made on the basis of the Price per Unit Bid for **“Traffic Signs (Supply, Install)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for the supply, transport and installation of the sign, signpost and hardware, and all other items necessary for the successful completion of the work.
- .4 Measurement for Payment for the supply and installation of new traffic signs will be made on the count of each sign (sign and post) installed and accepted by the Departmental Representative.
- .5 Payment for relocating existing signs will be made on the basis of the Price per Unit Bid for **“Sign Relocation (Remove, Temporarily Stockpile, Reinstall)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for the removal, temporary stockpile, transport and reinstallation of existing sign faces, removal and offsite disposal of existing signposts and hardware, supply and installation of new signposts and hardware, and all other items necessary for the successful completion of the work.
- .6 Measurement for Payment for relocating existing signs will be made by the count of each traffic sign (sign and post) removed, reinstalled and accepted by the Departmental Representative. A single signpost designated to hold multiple signs will be counted as one (1) sign for payment.
- .7 Payment for removal of existing delineators and installation of new delineators will be made on the basis of the Price per Unit Bid for **“Delineators (Remove, Dispose, Supply, Install)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for the supply and installation of new delineators, and all other items necessary for the successful completion of the work. Removal and disposal of existing delineators shall be considered incidental to the work.
- .8 Measurement for Payment for removal of existing delineators and installation of new delineators will be made on the count of each delineator supplied, installed, and accepted by the Departmental Representative. Delineators removed and disposed shall not be measured for payment, and shall be considered incidental to the work.
- .9 Mobilization and demobilization required for this Work shall be incidental to **“Mobilization and Demobilization”** and no additional payment will be made.
- .10 Traffic management and Quality management required for this Work shall be incidental to **“Quality Management and Traffic Management”** and no separate payment will be made to the contractor.
- .11 Environmental mitigations, including but not limited to bird sweeps required in accordance with Section 01 35 43 – Environmental Protection, for the Work in this Section shall be incidental to the Contract and no separate payment will be made to the Contractor.



1.2 REFERENCES

- .1 Government of Northwest Territories (GNWT):
 - .1 Standard Specifications for Highway Construction (latest edition).
 - .2 Standard Drawings (latest edition).
- .2 Transportation Association of Canada (TAC):
 - .1 Manual of Uniform Traffic Control Devices for Canada (January 2014, or latest edition).

1.3 SUBMITTALS

- .1 Prior to ordering Security Gate, the Contractor shall submit to the Departmental Representative security gate manufacturer's product data / shop drawings for review and acceptance in accordance with Section 01 33 00 – Submittal Procedures.

PART 2 PRODUCTS

2.1 GENERAL

- .1 All materials shall be free from wane, and shipments shall be protected from road and weather conditions.
- .2 Any materials damaged by the Contractor shall be replaced by the Contractor at their own expense.

2.2 TRAFFIC SIGNS AND SIGNPOSTS

- .1 Traffic signs shall be fabricated and supplied in accordance with the standards set out in the latest edition of TAC Manual of Uniform Traffic Control Devices for Canada.
- .2 Galvanized signposts, bolts and hardware shall be fabricated and supplied in accordance with the latest version of GNWT Standard Drawing SD-200-02-13 "Breakaway Sign Post" (see Appendix F).
- .3 The length of post(s) required for each sign shall be determined by the Contractor, but shall, in all cases, meet the minimum and maximum values shown in the latest version of GNWT Standard Drawing SD-200-02-12 "Typical Sign Installation Height and Lateral Locations" (see Appendix F).

2.3 SECURITY GATE

- .1 Security Gate shall be in accordance with the Contract Drawings and City of Surrey Supplementary Standard Drawing SSD-R.36 (Appendix E), and come complete with posts, gate, and hinges.

2.4 RIPRAP BOULDERS

- .1 Riprap Boulders shall be in conformance with Section 31 05 16 – Aggregates: General.

PART 3 EXECUTION

3.1 SECURITY GATE INSTALLATION

- .1 Excavate and remove the existing security gate and associated components as shown on the Contract Drawings. Dispose of existing gate and associated components at Inuvik Solid Waste Disposal Facility, or an alternative offsite facility proposed by the Contractor and permitted to accept



the materials. Salvage existing lock and chain (if present) and return to Departmental Representative.

- .2 The gate posts shall be attached to the steel pipe pile foundations via a sleeve, secured by bolts. The parameters for the pipe piles are as follows:

Parameter	Design Value
Pipe Pile Outside Diameter	150 mm
Minimum Borehole Diameter	305 mm (based on a 6 inch auger)
Steel Yield Strength (ASTM A252, Grade 3)	310 MPa
Minimum Grout Compressive Strength	20 MPa
Grout/Bedrock Bond Strength	125 kPa
Active Layer Thickness	2.5 m

- .3 Boreholes for piles should be drilled at least 3 m into bedrock, which is anticipated to range 7 m to 13 m below ground surface. The borehole diameter should be at least 50 mm greater than the pipe pile diameter to provide adequate space for the grout to completely surround the pile. Upon completion of drilling, the boreholes should be cleaned of any drill cuttings, mud, water, slough, and other deleterious materials.
- .4 Pipe piles should consist of 150 mm diameter steel pipes with grout slots cut in the pipe walls to allow the grout to completely surround the pile and provide a mechanical interlock between the grout and the pile. Grout slots should measure 50 mm wide by 100 mm long, and pairs should be cut on opposite sides of the pile at 500 mm centre-to-centre spacing throughout the expected length of pile embedded in bedrock.
- .5 Pile grout should consist of a non-shrink, cementitious grout designed for permafrost conditions with a minimum compressive strength of 20 MPa, equivalent to SikaGrout® Arctic-100, Multicrete XPR™ Freeze Pipe Grout, or similar. Grout should be mixed and placed using a grout plant with an integral pump and mechanical mixer with shearing type action. Water used to mix the grout should be warmed so that the grout temperature is between 20°C and 25°C when it is placed.
- .6 Immediately prior to installation, piles should be cleaned of any loose materials, preservatives, oil, grease, or other deleterious materials to allow for a strong bond between the grout and the pile. Each pile should be installed and grouted as soon as reasonably possible after completion of each borehole to minimize post-drilling disturbance to the borehole.
- .7 Pipe piles can be installed by filling the prepared borehole with grout and then lowering the pile into the grout-filled borehole or by inserting the pile into the borehole first and then grouting. Piles should be grouted up from the base of the borehole through a tremie tube or similar in a single stage to no higher than 2.5 m below ground surface (active layer thickness). Once the pipe pile and grout have been installed, the pile should be vibrated with the drill, a concrete vibrator, sledgehammer, or similar method to consolidate the grout and fill any remaining voids.
- .8 After the pile grout has set, the remainder of the annulus around the pipe pile should be backfilled with clean, dry sand or pea gravel. For boreholes where temporary casing is required to control sloughing, the casing should be lifted out of the grouted zone immediately after grout placement to avoid permanently grouting the casing into the borehole. No loads should be applied to the piles for at least one (1) week after installation.



- .9 Following review and acceptance of security gate manufacturer's product data / shop drawings by the Departmental Representative, install security gate in the location shown on the Contract Drawings and in accordance with manufacturer's instructions.
- .10 Install gate plumb and to the depths, tolerances, and locations indicated on the Contract Drawings and to the satisfaction of the Departmental Representative.
- .11 Place Riprap Boulders in the locations shown on the Contract Drawings.

3.2 TRAFFIC SIGN AND DELINEATOR INSTALLATION

- .1 Remove and temporarily stockpile existing traffic signs and signposts designated for reinstallation. Ensure existing signs and signposts designated for reinstallation are protected from damage during removal, stockpile, transport and reinstallation. Remove and dispose offsite existing delineators.
- .2 Upon completion of underlying work and acceptance by the Departmental Representative, supply and install new traffic signs, signposts and delineators, and reinstall existing traffic signs and signposts at the locations shown in the Contract Drawings.
- .3 Traffic signs shall be installed / reinstalled in accordance with the latest versions of GNWT Standard Drawing SD-200-02-12 "Typical Sign Installation Height and Lateral Locations" and Standard Drawing SD-200-02-13 "Breakaway Sign Post". Delineators shall be installed in accordance with the latest versions of GNWT's Standard Drawing SD-200-02-11 "Delineators".
- .4 Posts shall be set vertically and backfilled with material free of organics. The backfill around the posts shall be placed in thin layers and thoroughly compacted for the full depth.
- .5 Signs, delineators and tabs shall be fixed securely to the post(s).
- .6 The Contractor is responsible for the maintenance and protection of the traffic signs, breakaway base posts, bolts and hardware and kilometre posts until the completion of the project.

END OF SECTION



PART 1 **GENERAL**

1.1 **SUMMARY**

- .1 This Section defines correction to maximum dry density to take into account aggregate particles larger than 25 mm when compacting materials in unfrozen conditions.
- .2 Refer to Section 01 45 00 – Quality Management, Section 31 24 14 – Roadway Excavation, Embankment, and Compaction, Section 32 11 19 – Sub-Base Gravel, and Section 32 11 25 – Surfacing Gravel for further details.

1.2 **REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C127, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
 - .2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft lbf/ft³ (600 kN m/m³)).
 - .3 ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft lbf/ft³ (2,700 kN m/m³)).
 - .4 ASTM D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.3 **DEFINITIONS**

- .1 Corrected maximum dry density is defined as:
 - .1 $D = D1xD2 / (F1 \times D2) + (F2 \times D1)$
 - .2 $D = (F1 \times D1) + (0.9 \times D2 \times F2)$
 - .3 Where: D = corrected maximum dry density kg/m³.
 - .1 F1 = fraction (decimal) of total field sample passing [19] [4.75] mm sieve
 - .2 F2 = fraction (decimal) of total field sample retained on [19] [4.75] mm sieve (equal to 1.00 F1)
 - .3 D1 = maximum dry density, kg/m³ of material passing [19] [4.75] mm sieve determined in accordance with Method [A] [C] of [ASTM D698] [ASTM D1557].
 - .4 D2 = bulk density, kg/m³, of material retained on [19] [4.75] mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127.
 - .4 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253 [dry method] [wet method] when directed by the Departmental Representative.



PART 2 **PRODUCTS**

2.1 **NOT USED**

PART 3 **EXECUTION**

3.1 **NOT USED**

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Measurement and Payment for Aggregate Materials shall be per the applicable work included in Section 31 24 14 – Roadway Excavation, Embankment, and Compaction, Section 32 11 19 – Sub-Base Gravel, Section 32 11 25 – Surfacing Gravel, and any other section as required by these specifications.

1.2 **REFERENCES**

- .1 American Society for Testing and Materials (ASTM), latest edition:
 - .1 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
 - .2 ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
 - .3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - .5 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .6 ASTM C117, Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .7 ASTM C127, Standard Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate.

1.3 **SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Allow continual sampling by Departmental Representative during production.
 - .3 Provide Departmental Representative with access to source and processed material for sampling.
 - .4 Install sampling facilities at discharge end of production conveyor, to allow Departmental Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by Departmental Representative to permit full cross section sampling.
 - .5 Acceptance of a material at source does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory.
 - .6 Provide front end loader or other suitable equipment including trained operator for stockpile sampling as necessary. Move samples to storage place as directed by Departmental Representative.
 - .7 Supply new or clean sample bags or containers according appropriate to aggregate materials.



- .8 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.4 QUALITY MANAGEMENT

- .1 Quality Control and Quality Assurance in accordance with Section 01 45 00 – Quality Management.
- .2 The Contractor shall not produce aggregate until the Contractor's Quality Management Plan has been reviewed and accepted by the Departmental Representative per Section 01 45 00 – Quality Management and has in place testing facilities for aggregate production that are in accordance with the accepted Quality Control Plan.
- .3 In addition to the Quality Control undertaken by the Contractor, the Departmental Representative may undertake, through an independent testing firm, random sampling, inspection, and testing for the purpose of Quality Assurance.
- .4 Provide access to all portions of the work for sampling by the Departmental Representative.
- .5 If requested, install sampling facilities at discharge end of production conveyor to allow the Departmental Representative to obtain representative samples of items being produced. Stop or slow conveyor belt when directed by the Departmental Representative to permit full cross-section sampling.
- .6 Aggregates which do not meet specified tolerances or quality for intended use are subject to rejection by the Quality Control and Quality Assurance processes.

PART 2 PRODUCTS

2.1 AGGREGATE SOURCE

- .1 The Contractor will be solely responsible for ensuring that the aggregate source(s) selected by the Contractor continuously achieve all aggregate material properties, quality and gradation requirements as outlined in this contract specification for the material intended use.
- .2 The Contractor may utilize the following aggregate sources:
 - .1 GNWT Km 251 Quarry Pit, Dempster Highway, NWT.
 - .2 Other locations selected by the Contractor and acceptable to the Departmental Representative.
- .3 The Contractor will be responsible for the manufacture, screening, blending, aeration or drying, or any other required processing to achieve all material requirements, regardless of the Aggregate source.
- .4 A minimum of seven (7) calendar days prior to supply or commencement of manufacture of materials from the Contractor's selected aggregate source(s), provide to the Departmental Representative for review and acceptance the location, name, and owner of material source(s) and test results confirming source(s) meet this Contract's required aggregate material properties and quality.

2.2 AGGREGATES GENERAL

- .1 The Contractor will be responsible for the manufacture, screening, blending, aeration or drying, or any other required processing to achieve all material requirements.
- .2 Aggregate Material shall be produced by crushing of bedrock. Aggregate Material is to be sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay



lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.

- .3 Aggregate Materials must meet the following minimum requirements to be accepted:
 - .1 Not contain soft particles, shale or shale seams, overburden, organic material, snow, ice / frozen aggregate or other deleterious material.
 - .2 Flat and elongated particles of coarse aggregate to ASTM D4791.
 - .1 Flat and elongated particles are those whose greatest dimension exceeds five (5) times their least dimension.
 - .3 Fine aggregates to be one of or a blend of the following:
 - .1 Screenings produced in crushing of quarried rock, boulders, gravel, or slag.
 - .2 Natural sand.
 - .3 Manufactured sand.
 - .4 Coarse aggregates to be one of or a blend of the following:
 - .1 Crushed rock.
 - .2 Gravel and crushed gravel composed of naturally formed particles of stone.
 - .5 Beach gravels shall not be acceptable sources.
 - .6 Salt water submerged deposits shall not be acceptable sources.

2.3 EMBANKMENT – 300 MM MINUS

- .1 Embankment – 300 mm Minus shall be manufactured / supplied by the Contractor to ensure the material conforms with the following requirements:
 - .1 Embankment material shall consist of 300 mm Minus rock that has been deemed suitable for roadway embankment construction and approved by the Departmental Representative. 95% of the material must be retained on the 25 mm sieve. The designated sources for the Embankment – 300 mm Minus rock will be GNWT's existing quarry No. 8 located at Dempster Highway Km 251, or another source proposed by the Contractor and acceptable to the Departmental Representative.
 - .1 Should the Contractor elect to source the Embankment – 300 mm Minus material from a location other than GNWT's Km 251 Quarry Site, the Contractor shall be solely responsible for obtaining permits necessary to facilitate material extraction, including any associated fees or costs.
 - .2 The material shall consist of hard durable particles free from clay lumps, organic matter, and other deleterious materials.
 - .1 Where Embankment – 300 mm Minus contains some frozen material acceptable to the Departmental Representative and/or the air temperature during placement and compaction is less than or equal to zero degrees Celsius (0°C), the moisture content of the Embankment – 300 mm when tested in accordance with ASTM D2216 shall be less than or equal to 4%.
 - .3 Select Embankment – 300 mm Minus will be crushed material with a maximum particle size of 300 mm and is to be used in the locations and extents shown on the Contract Drawings.



Table 31 05 16 – 01: Gradation Limits: Embankment -300 mm Minus	
Sieve Designation (mm)	% Passing by Weight
300	100
25	5% maximum

- .4 Liquid limit when tested in accordance with ASTM D4318: Maximum 25.
- .5 Los Angeles degranulation when tested in accordance with ASTM C131: Maximum % loss by weight 45.
- .6 Flat and elongated particles when tested in accordance with ASTM D4791, (with Length to thickness ratio greater than 5): Maximum by mass 15.
- .7 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least one (1) freshly fractured face. Materials to be divided into ranges using methods of ASTM C136.

2.4 EMBANKMENT – 75 MM MINUS

- .1 Embankment – 75 mm Minus shall be Sub-Base Gravel in accordance with this specification section.

2.5 SUB-BASE GRAVEL

- .1 Sub-Base Gravel shall be manufactured / supplied by the Contractor to ensure the material conforms with the following requirements:
 - .1 The material shall consist of hard durable particles free from clay lumps, organic matter, and other deleterious materials.
 - .1 Where Sub-Base Gravel contains some frozen material acceptable to the Departmental Representative and/or the air temperature during placement and compaction is less than or equal to zero degrees Celsius (0°C), the moisture content of the Sub-Base Gravel when tested in accordance with ASTM D2216 shall be less than or equal to 4%.
 - .2 When tested in accordance with ASTM C136 / C136M and ASTM C117, the material shall have a gradation conforming to the following gradation limits, and having a smooth curve without sharp breaks when plotted on semi-log grading chart:
 - .3 Sub-Base Gravel will be crushed material with a maximum particle size of 75 mm and is to be used as fill material for the earthwork construction.

Table 31 05 16 – 02: Gradation Limits: Sub-Base Gravel	
Sieve Designation (mm)	% Passing by Weight
75	100
37.5	60 - 100
19	35 - 80
9.5	25 - 60



4.75	20 - 40
2.36	15 - 30
1.18	10 - 20
0.300	3 - 10
0.075	3 - 8

- .4 Liquid limit when tested in accordance with ASTM D4318: Maximum 25.
- .5 Los Angeles degranulation when tested in accordance with ASTM C131: Maximum % loss by weight 45.
- .6 Flat and elongated particles when tested in accordance with ASTM D4791, (with Length to thickness ratio greater than 5): Maximum by mass 15.
- .7 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least one (1) freshly fractured face. Materials to be divided into ranges using methods of ASTM C136.
 - .1 Passing 37.5 mm and retained on 19 mm and passing 19 mm and retained on 4.75 mm for Sub-Base Gravel.

2.6

SURFACING GRAVEL

- .1 Surfacing Gravel shall be manufactured / supplied by the Contractor to ensure the material conforms with the following requirements:
 - .1 The material shall consist of hard durable particles free from clay lumps, organic matter, and other deleterious materials. Cohesion of this aggregate is achieved by plastic fines.
 - .1 Where Surfacing Gravel contains some frozen material acceptable to the Departmental Representative and/or the air temperature during placement and compaction is less than or equal to zero degrees Celsius (0°C), the moisture content of the Surfacing Gravel when tested in accordance with ASTM D2216 shall be less than or equal to 4%.
 - .2 When tested in accordance with ASTM C136 / C136M and ASTM C117, the material shall have a gradation conforming to the following gradation limits, and having a smooth curve without sharp breaks when plotted on semi-log grading chart:
 - .3 Surfacing Gravel will be crushed material with a maximum particle size of 25 mm and is to be used as fill material for the earthwork construction.

Table 31 05 16 – 03: Gradation Limits: Surfacing Gravel	
Sieve Designation (mm)	% Passing by Weight
25	100
19	85 - 100
9.5	60 - 85
4.75	40 - 70
1.18	20 - 40
0.300	10 - 25
0.075	5 - 10



- .4 Liquid limit when tested in accordance with ASTM D4318: Maximum 25.
- .5 Plasticity index when tested in accordance with ASTM D4318: Maximum 6.
- .6 Los Angeles degranulation when tested in accordance with ASTM C131: Maximum % loss by weight 45.
- .7 Flat and elongated particles when tested in accordance with ASTM D4791, (with Length to thickness ratio greater than 5): Maximum by mass 15.
- .8 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least one (1) freshly fractured face. Materials to be divided into ranges using methods of ASTM C136.
 - .1 Passing 25 mm and retained on 19 mm and passing 19 mm and retained on 4.75 mm for Surfacing Gravel.

2.7

RIPRAP

- .1 Regardless of the Riprap source, the Riprap shall conform to the following requirements:
 - .1 British Columbia Ministry of Transportation and Infrastructure (BC MoTI) – Standard Specifications for Highway Construction (Latest Edition) Section 205 – Riprap, Class 10 kg.
 - .1 Gradation of Rock (Class 10):

Table 31 05 16 – 04: Gradation of Rock				
Class of Riprap (kg)	Rock Mass (kg)			Max Size
	Percentage Smaller Than Given Rock Mass			
	15%	50%	85%	
10	1	10	30	50

- .2 Gradation and Intermediate Dimension of Rock (Class 10):

Table 31 05 16 – 05: Gradation and Intermediate Dimension of Rock				
Class of Riprap (kg)	Intermediate Dimension (mm)			Max Size
	Percentage Smaller Than Intermediate Dimension			
	15%	50%	85%	
10	90	200	285	350

Note: The intermediate dimension as defined in the Wolman method as per FHWA FLH T 521 corresponding to the rock mass shown in Table 31 05 16 – 03, based on spherical volume, using Specific Gravity = 2.50. Regardless of actual source Specific Gravity, the dimensions indicated remain applicable.



- .2 Neither the breadth or the thickness of any individual piece of Riprap material is to be less than one third of its length. A maximum of 2.0 percent by weight of such pieces will be permitted.
- .3 Hard, dense with relative density not less than 2.65 in accordance with ASTM C127, free from seams, cracks or other structural defects, to meet following size distribution for use intended:
 - .1 Only non-acid generating and non-metal leaching rock is suitable.

2.8 RIPRAP BOULDERS

- .1 Riprap boulders shall be hard, durable stones free from splits, seams, or defects likely to impair its soundness during transport or after install and have an average dimension of 0.6 metres.

PART 3 EXECUTION

3.1 AGGREGATE SOURCE PREPARATION

- .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials. Payment for clearing, brushing and disposal of vegetation to facilitate aggregate production will not be made and will be considered incidental to this specification section.
- .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
- .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
- .4 When excavation is completed dress sides of excavation to nominal 1.5H:1V slope, and provide drains or ditches as required to prevent surface standing water.
- .5 Trim off and dress slopes of waste material piles and leave site in neat condition.
- .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.

3.2 PROCESSING

- .1 Process aggregates uniformly using methods that prevent contamination, segregation and degradation.
- .2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified in these specifications.
- .3 Use methods and equipment approved by Departmental Representative.
- .4 Wash aggregates, if required to meet specifications. Use only equipment approved by Departmental Representative.
- .5 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.



3.3 QA SAMPLING BY THE DEPARTMENTAL REPRESENTATIVE

- .1 Provide Departmental Representative with access to source and processed material for sampling during production.
- .2 Install sampling facilities at discharge end of production conveyor, to allow Departmental Representative to obtain representative samples of items being produced. Stop conveyor belt when directed by Departmental Representative to permit full cross section sampling.
- .3 Pay cost for sampling and testing of aggregates which fail to meet specified requirements.
- .4 Aggregates that do not meet specified tolerances for intended use are subject to rejection by the Departmental Representative as part of the QA process.

3.4 HANDLING AND TRANSPORT

- .1 Handle and transport Aggregate Material to avoid segregation, contamination and degradation.
- .2 Load limit restrictions will be in accordance with GNWT Highway Motor Vehicle Act pertaining to registered weight limits and vehicle size.
- .3 Repair and maintain stockpile / laydown areas as necessary to a condition equal to or better than when work began.
- .4 The Contractor shall be responsible for all haul roads required to access and transport the Aggregate material from the sources to the project site, including haul road maintenance and any initial upgrades required for the Contractor to haul the aggregate material safely from Highway 8. Following completion of the hauling and stockpiling, the Contractor shall leave the road in the same or better condition than at the start of the project, or in a condition acceptable to the haul road owner.
- .5 All costs associated with the maintenance (including snow and ice removal, traction aids or other works required to complete the work in accordance with the contract) of this road shall be considered incidental to the project and no additional payment will be made.
- .6 Transport **“Surfacing Gravel for Maintenance (Supply, Haul, Stockpile)”** from GNWT Pit Km 251 Quarry Site and stockpile at the designated location at the North Leg Terminus (approximately 12.7 km each way), or from another quarry / pit selected by the Contractor and accepted by the Departmental Representative.
 - .1 Location(s) for stockpiling **“Surfacing Gravel for Maintenance (Supply, Haul, Stockpile)”** have been identified on the contract drawings and shall be confirmed by the Departmental Representative following Contract award.

3.5 STOCKPILING AND MAINTENANCE

- .1 Stockpile aggregates to facilitate successful completion of the work in locations acceptable to the Departmental Representative, in conformance with applicable regulatory requirements, and not closer than 5 m from the edge of the excavation slopes. Stockpiled Aggregate Materials are to be protected and handled in a way as to avoid segregation, contamination, degradation, and theft. Do not stockpile on asphalt pavement or BST surfaces.
 - .1 Stockpiles shall have maximum sideslopes of 1.5H:1V.
- .2 Stockpile **“Surfacing Gravel for Maintenance (Supply, Haul, Stockpile)”** in the location(s) shown on the Contract Drawings. Selection of all other stockpiles required to facilitate the work, if required,



shall be the responsibility of the Contractor, and shall be acceptable to the Departmental Representative.

- .3 Stockpile/s shall be in conformance with requirements of the Occupational Health and Safety Act.
 - .1 A stockpile must be planned, constructed, used and maintained so that no person working at the workplace is endangered by any instability of the stockpiled material.
 - .2 The contractor shall ensure banks of the stockpile/s are shaped in a manner to avoid any species of bird from nesting. Should any nests be identified during the contract which would deem the material unusable the Contractor shall replace the material to the satisfaction of the Departmental Representative.
 - .3 Lift thickness shall be limited to maximum of one (1) metre.
- .4 Stockpile aggregates in sufficient quantities to meet project schedules.
- .5 Stockpile sites shall be cleared of all vegetation, trees, brush, rocks, snow, ice, standing water or other debris. Stockpile sites shall have a uniform level surface, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
- .6 Except where stockpiled on acceptably stabilized areas, provide compacted gravel base not less than 300 mm thickness to prevent contamination of aggregate. Do not incorporate compacted base of pile into work.
- .7 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing (minimum of 5 m apart). Aggregates which become mixed with others of a different kind, class, source, or gradation, or which become contaminated by foreign material, will be rejected.
- .8 Ensure stockpiled material is not placed in ditches or interferes with the established drainage patterns. Provide drainage / ditches around the perimeter of each stockpile as required to prevent ponding of water. Ensure ready run-off of surface water following stockpiling of aggregate materials, to the satisfaction of the Departmental Representative.
- .9 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative.
- .10 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpiles as required to prevent segregation.
- .11 Radial Telescopic Conveyor / Super Stacker will be permitted provided the Contractor sets the height of the conveyor as low as possible to minimize segregation, and the Contractor ensures layering is evenly distributed.
- .12 Prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.
- .13 The Contractor shall be responsible for any and all material loss for any circumstance including unusable (i.e., bird nesting). The Contractor shall replace the material to the satisfaction of the Departmental Representative.
- .14 Provide planks or protected runways for operating trucks on stockpiles when necessary to prevent dirt or other deleterious material from being tracked onto the stockpiled material.



- .15 All costs associated with stockpile maintenance (including snow and ice removal, traction aids, planks / protected runways, or other works required to complete the work in accordance with the contract) shall be considered incidental to the project and no additional payment will be made.

3.6 CLEANING

- .1 Any stockpiles temporarily placed on PSPC or NRCan property shall be completely removed from the site by the Contractor upon completion of the works, and the site restored to a condition equal to or better than at the commencement of the work.
- .2 Leave any unused aggregates in neat, compact stockpiles in locations directed by the Departmental Representative.
- .3 The Contractor shall be responsible for any cleanup of aggregate sources.

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for completion of Clearing and Brushing will be made on the basis of the Lump Sum Bid for **“Clearing and Brushing”** in the Bid and Acceptance Form. The Lump Sum Bid shall include all costs for labour, equipment and materials for clearing of trees and brush, mulching, chipping, offsite disposal to the Inuvik Solid Waste Disposal Facility (or an alternative location proposed by the Contractor and permitted to accept the materials), and all other items necessary for successful completion of the work in accordance with these specifications.
- .2 Measurement Payment for completion of Clearing and Brushing will be made by Lump Sum based on the percentage of work completed within the Clearing and Brushing limits shown on the Contract Drawings and accepted by the Departmental Representative.
 - .1 Clearing and Brushing not shown on the Contract Drawings includes vegetation that will need to be cleared 1 m beyond the edge of the proposed embankment toe / limits of construction and will not be measured for payment and will be considered incidental to the work. This estimated area to be cleared and brushed is estimated to be in the range of 3,000-5,000 m².
- .3 Clearing and Brushing required to facilitate extraction of materials at Contractor selected aggregate sources, disposal of Common Excavation at the ISSF Old Borrow Site (Town Pit), or stockpiling of Surfacing Gravel for Maintenance purposes at the North Leg Terminus Maintenance Gravel stockpiling location (if required) will not be measured for payment and will be considered to the applicable payment item in Section 31 05 16 – Aggregates: General, Section 31 24 14 – Roadway Excavation, Embankment, and Compaction.
- .4 No separate measurement or payment for hauling and/or offsite disposal of Clearing and Brushing material will be made.
- .5 Mobilization and demobilization required for this Work shall be incidental to **“Mobilization and Demobilization”** and no additional payment will be made.
- .6 Traffic management and Quality management required for this Work shall be incidental to **“Quality Management and Traffic Management”** and no separate payment will be made to the contractor.
- .7 Environmental mitigations, including but not limited to bird sweeps required in accordance with Section 01 35 43 – Environmental Protection, for the Work in this Section shall be incidental to the Contract and no separate payment will be made to the Contractor.

1.2 **SUBMITTALS**

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Quality Management: in accordance with Section 01 45 00 – Quality Management.
- .3 Submit Preconstruction Survey of existing conditions prior to commencing work in accordance with Section 01 29 00 – Payment Procedures.

1.3 **DEFINITIONS**

- .1 Clearing and Brushing:



- .1 Consists of the removing or the cutting off, at the heights described herein or at such heights as approved by the Departmental Representative, trees, stumps and brush, the removal of all fallen timber, fallen branches and other surface litter from within the limits of work shown on the Contract Drawings or as directed by the Departmental Representative and shall include the disposal of all in accordance with this Specification. Shrubs and other vegetation that can be cut with a brush scythe or mowing machine will not be considered as clearing.
- .2 Flush Cut:
 - .1 Removal of trees and brush such that stumps are cut flush with ground elevation and root structure is undisturbed.
- .3 Clearing and Brushing must be carried out in accordance with the Northwest Territories Lands Act, and the Northwest Territories Forest Protection Act where applicable. It shall be the Contractor's responsibility to familiarize itself with these regulations and conditions. The Contractor is responsible for all Work required to comply with these regulations.

1.4 QUALITY MANAGEMENT

- .1 All Quality Management by the Contractor shall be in accordance with Section 01 45 00 – Quality Management.

1.5 PROTECTION

- .1 The Contractor shall prevent damage to trees and vegetation, root structures, watercourses, natural features, and man-made structures which are to remain. No grubbing operations shall be completed.
- .2 The Contractor shall repair any damaged items to approval of Departmental Representative. The Contractor shall replace any trees designated to remain, if damaged, as directed by Departmental Representative. No extra payment will be made to the Contractor for any repair or clean-up Work required.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 PREPARATION

- .1 The Contractor shall not commence work on this activity until approval to proceed has been granted by the Departmental Representative and other Authorities having Jurisdiction as required by the Northwest Territories Lands Act, and the Northwest Territories Forest Protection Act where applicable.
- .2 The Contractor is responsible to inspect the site and verify with Departmental Representative the Clearing and Brushing limits and any items or areas designated to remain.
- .3 Schedule Clearing and Brushing to facilitate roadway widening in in conformance with Item 3.3 Sequence of Work in Section 01 11 10 – Summary of Work.
- .4 No Clearing and Brushing activities shall be undertaken outside the limits shown on the Contract Drawings, unless where pre-approved by the Departmental Representative.



- .5 The Contractor shall provide the survey for clearing limit markers for the clearing operations. The Contractor shall provide notice to the Departmental Representative to review the clearing limit markers in advance of the Clearing and Brushing operations.

3.2 CLEARING

- .1 Clear and flush cut trees, brush, uprooted stumps, vegetative growth, surface debris and other vegetation designated for removal within the Clearing and Brushing limits shown on the Contract Drawings and as directed by the Departmental Representative.
- .2 No grubbing of stumps, roots, embedded logs or other vegetation.

3.3 REMOVAL AND DISPOSAL

- .1 Dispose of cleared and brushed material offsite at the Inuvik Solid Waste Disposal Facility, or an alternative location proposed by the Contractor and permitted to accept the materials.
- .2 Burning of cleared and brushed material shall not be permitted.

3.4 FINISHED SURFACE

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

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for Common Excavation will be made on the basis of the Price per Unit Bid for “**Common Excavation – Waste (Excavate, Load, Haul, Compact, Stockpile)**” in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with snow removal prior to excavation (if required) and as required during construction to facilitate performance and inspection of the work, clearing and brushing of the proposed stockpile location(s) (if required), the excavation, dewatering (if required), loading, hauling, and compaction and stockpiling of existing road embankment at ISSF Old Borrow Site (Town Pit) or another stockpile location proposed by the Contractor and accepted by the Departmental Representative, grading and shaping of stockpiles, cleanup and stockpile maintenance, and all other items necessary for the successful completion of the work in accordance with these specifications.
- .2 Measurement for Payment for Common Excavation will be made on the in-situ volume of material surveyed in cubic metres excavated from the limits of work (i.e., volume comparison of the Contractor's Preconstruction Survey and post-Common Excavation survey), loaded, transported, compacted and stockpiled in accordance with these specifications, and accepted by the Departmental Representative. Quantities of Common Excavation shall be determined from survey (see Item 1.3 Survey in Section 01 29 00 – Payment Procedures for details). Common Excavation beyond the limits shown on the Contract Drawings shall not be measured for payment, unless where preapproved by the Departmental Representative. Excavation required to facilitate removal of existing culverts, installation of new CSP culverts and installation culvert riprap end treatment will not be measured for payment and will be considered incidental to the applicable payment item in Section 33 42 13 – Pipe Culverts. Stripping (where required) shall not be measured for payment and shall be considered incidental to “Embankment (Supply, Haul, Place, Compact)”.
- .3 Payment for Embankment will be made on the basis of the Price per Unit Bid for “**Embankment – (Supply, Haul, Place, Compact)**” in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with snow removal prior to placement (if required) and as required during construction to facilitate performance and inspection of the work, excavation, manufacture, temporary stockpiling (if required), loading, transport, placement, shaping, watering and/or drying and compaction of Embankment – 300 mm Minus material and Embankment – 75 mm Minus material (in the locations indicated in the Contract Drawings and these specifications), dust control, and all other items necessary for the successful completion of the work in accordance with these specifications. The Price per Unit Bid shall further include track packing in unfrozen conditions in summer 2023 the sideslopes of Embankment placed in frozen conditions.
 - .1 Should the Contractor not complete the placement of Embankment prior to the ground freezing in Fall 2022 (whichever occurs first), the Price per Unit Bid shall further include all costs for stripping of organic materials beneath the footprint of the widened roadway, grubbing of stumps and roots within the stripped area, loading, hauling and disposal at the ISSF Old Borrow Site (Town Pit), and all other items necessary for the successful completion of the work.
- .4 Measurement for Payment for the supply, placement and compaction of Embankment will be made on the volume of Embankment – 300 mm Minus and Embankment – 75 mm Minus material surveyed in cubic metres, incorporated into the work at the completion of shaping and compaction (i.e., volume comparison of the Contractor's Preconstruction Survey and post-Embankment survey), and accepted by the Departmental Representative.



- .1 Consolidation of the existing organic mat underlying the proposed Embankment is anticipated for Embankment placed prior to freeze-up. Consolidation of the organic mat may be in the order of 300 mm in some locations. Additional granular material required due to consolidation of the existing organic mat will be considered incidental and will not be measured for payment.
- .2 Should the Contractor not complete the placement of Embankment prior to the ground freezing in Fall 2022), the additional volume of Embankment to backfill the stripped volume will not be measured for payment.
- .5 Payment for Nonwoven Geotextile will be made on the basis of the Price per Unit Bid for **“Nonwoven Geotextile (Supply, Install)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the supply, transport, and installation of Nonwoven Geotextile and pins (following Common Excavation of the existing road embankment), and all other items necessary for successful completion of the work.
- .6 Measurement for Payment for completion of Nonwoven Geotextile will be made on the area of existing road covered with Nonwoven Geotextile upon completion of Common Excavation of the existing road embankment, surveyed in square metres and accepted by the Departmental Representative. No allowance will be made for seams and overlaps in the Nonwoven Geotextile quantity. Nonwoven Geotextile to facilitate installation of CSP culverts and culvert riprap end treatment will not be measured for payment, and shall be considered incidental to the applicable payment items in Section 33 42 13 – Pipe Culverts.
- .7 Excavation required for Access Development or to facilitate extraction / manufacture of granular materials at Contractor selected aggregate sources shall not be measured for payment. No separate measurement or payment for hauling and stockpiling will be made.
- .8 Mobilization and demobilization required for this Work shall be incidental to **“Mobilization and Demobilization”** and no additional payment will be made.
- .9 Traffic management and Quality management required for this Work shall be incidental to **“Quality Management and Traffic Management”** and no separate payment will be made to the contractor.
- .10 Environmental mitigations, including but not limited to bird sweeps required in accordance with Section 01 35 43 – Environmental Protection, for the Work in this Section shall be incidental to the Contract and no separate payment will be made to the Contractor.

1.2 DEFINITIONS

- .1 Common Excavation: excavation of materials that are not rock excavation or stripping.
- .2 Grubbing: excavating and disposing stumps and roots below the ground surface.
- .3 Native Material: material in place at the time of tender.
- .4 Organic Material: soil in which plants can grow, comprising primarily of mineral particles mixed with decayed organic matter and having the capability of retaining water. Organic material is typically dark brown or black in colour.
- .5 Rock excavation:
 - .1 Material from solid masses of igneous, sedimentary or metamorphic rock which, prior to removal, was integral with parent mass. Material that cannot be ripped with reasonable effort from Caterpillar D9L or equivalent and considered integral with parent mass.



- .2 Boulder or rock fragments measuring in volume one cubic metre or more.
- .6 Stripping: excavation of organic material covering the original ground.

1.3 REFERENCES

- .1 American Society for Testing Materials (ASTM), latest edition.
 - .1 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .2 ASTM D6938-10 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.
 - .3 ASTM D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - .4 ASTM D6241, Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.
 - .5 ASTM D4533, Trapezoid Tearing Strength Testing of Geotextiles.
 - .6 ASTM D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 - .7 ASTM D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .8 ASTM D4355, Standard Test Method For Deterioration Of Geotextiles By Exposure To Light, Moisture And Heat In A Xenon Arc-Type Apparatus.
 - .9 ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
- .2 Alberta Transportation Testing (ATT):
 - .1 ATT-58/96 Density Test, Control Strip Method.

1.4 SUBMITTALS

- .1 Submittals shall be in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures.

**PART 2** **PRODUCTS****2.1** **EMBANKMENT**

- .1 Embankment shall be Embankment – 300 mm Minus Material and Embankment – 75 mm Minus Material in accordance with Section 31 05 16 – Aggregates: General.

2.2 **NONWOVEN GEOTEXTILE**

- .1 Nonwoven Geotextile shall meet or exceed the following minimum requirements:

Table 31 24 14 - 01: Nonwoven Geotextile			
Property	Test	Unit	Value
Grab Tensile Strength	ASTM-D4632	N (lb.)	1335 (300)
Elongation	ASTM-D4632	%	50
CBR Puncture	ASTM-D6241	N (lb.)	3671 (825)
Trapezoidal Tear	ASTM-D4533	195	512 (115)
Apparent Opening Size	ASTM-D4751	Mm (US Sieve)	0.150 (100)
Permittivity	ASTM-D4491	sec ⁻¹	1.0
Water Flow Rate	ASTM-D4491	l/m/m ² (gpm/ft ²)	3056 (75)
UV Resistance	ASTM-D4355	% retained at 500 hrs.	70

PART 3 **EXECUTION****3.1** **GENERAL REQUIREMENTS**

- .1 The Contractor is solely responsible for determining the means and methods to complete Common Excavation to the lines and grades shown on the Contract Drawings and in accordance these Specifications.
- .2 Carry out Excavations in compliance with Workers' Safety and Compensation Commission (WSSC).
- .3 Prior to commencement of excavation, the Contractor shall complete and submit the Preconstruction Survey to the Departmental Representative in accordance with Section 01 29 00 – Payment Procedures. Receive approval from Departmental Representative prior to commencing Common Excavation.
- .4 Complete all work in accordance with the Contractor's accepted EPP prepared for this work. See Section 01 35 43 – Environmental Protection for more details.

3.2 **EXCAVATION**

- .1 Following the Departmental Representative's review and acceptance of the Contractor's Preconstruction Survey, commence Common Excavation of the existing road embankment to the lines and grades shown on the Contract Drawings.
- .2 Schedule Common Excavation to facilitate roadway widening in in conformance with Item 3.3 Sequence of Work in Section 01 11 10 – Summary of Work.
- .3 Complete Common Excavation of the existing road embankment to the following tolerances:



- .1 Complete Common Excavation to within +/- 100 mm of the lines and grades as indicated on the Contract Drawings, or as accepted by the Departmental Representative, but not uniformly high or low.
- .4 During excavation, maintain profiles, crowns and cross slopes to provide good surface drainage.
- .5 If during excavation, material appearing to conform to classification for rock excavation is encountered, notify the Departmental Representative and provide sufficient time to enable measurements to be made to determine volume of rock. Payment for rock excavation (if required) will be completed via a change order.
- .6 Use care during Common Excavation activities to prevent destabilization, deformation or overloading of the existing road embankment slopes. To achieve this requirement, the Contractor may need to immediately load all excavated material (no temporary stockpiling on the existing road embankment).

3.3

HAULING AND STOCKPILING OF EXCAVATION MATERIALS

- .1 Common Excavation material shall be stockpiled at the ISSF Old Borrow Site (Town Pit). Stockpile Common Excavation in conformance with the Contract Drawings. The Contractor may propose an alternative stockpile location for Common Excavation material outside of PSPC's and NRCAN's Right-of-Way or other lands owned or leased by PSPC or NRCAN, for the Departmental Representative's review and acceptance. The Contractor shall be solely responsible for obtaining any permits necessary to allow stockpiling of Common Excavation material at a location other than the ISSF Old Borrow Site (Town Pit).
- .2 Prior to stockpiling excavated materials, clear and brush stockpile area (if required). Dispose of cleared and brushed materials. Payment for clearing and brushing to facilitate stockpiling of excavation materials will not be made and will be considered incidental to this specification section.
- .3 Off-road construction equipment (including equipment which exceeds legal highway load limits or dimensions) will be permitted to travel within the project limits of the ISSF road network for the purposes of hauling excavated materials to the ISSF Old Borrow Site (Town Pit). Off-road construction equipment will not be permitted on the Bituminous Surface Treatment (BST) / travelled lanes of Highway 8 (Dempster Highway) outside the project limits as shown on the Contract Drawings.
- .4 The Contractor shall be responsible for the implementation, maintenance, removal, and restoration of all haul roads, temporary drainage structures, and access points / ramps required for successful completion of the work, in accordance with the requirements of Section 01 14 00 – Work Restrictions, Construction Staging, Access Development, and Restoration.
- .5 Load, transport and stockpile Common Excavation material at ISSF Old Borrow Site (Town Pit). Construct stockpile sites as required and acceptable to the Departmental Representative. Stockpile sites shall be cleared of all vegetation, trees, brush, rocks, snow, ice, standing water or other debris and a uniform surface prepared before the Common Excavation material is deposited on the stockpile site.
- .6 When complete, the stockpile site shall be neat and regular in shape, occupying as small an area as is practicable, construction with sideslopes no steeper than 2.5H:1V. Spilling of material over the edges of the piles will not be permitted.
- .7 Stockpile Common Excavation material in uniform layers not greater than 0.6 m in thickness, and compact to 90% of the maximum dry density in accordance with ASTM D698 and ASTM D6938.



Density will be determined by Control Strip Method. During stockpiling operations, prevent ice and snow from becoming intermixed with Common Excavation materials.

- .8 Ensure Common Excavation material is not placed in ditches or interferes with the established drainage patterns. Provide drainage / ditches around the perimeter of each stockpile as required to prevent ponding of water. Ensure ready run-off of surface water following stockpiling of Common Excavation materials, to the satisfaction of the Departmental Representative.

3.4 PLACEMENT OF NONWOVEN GEOTEXTILE

- .1 Schedule Nonwoven Geotextile to facilitate roadway widening in in conformance with Item 3.3 Sequence of Work in Section 01 11 10 – Summary of Work.
- .2 Place Nonwoven Geotextile in the locations shown on the Contract Drawings, free from debris, snow and ice, or other deleterious material acceptable to the Departmental Representative.
- .3 Place Nonwoven Geotextile material by unrolling onto the ground surface in orientation, manner and locations indicated on Contract Drawings and retain in position with pins.
- .4 Place Nonwoven Geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .5 Place Nonwoven Geotextile on sloping surfaces in one continuous length from toe of slope to upper extent of Nonwoven Geotextile.
- .6 Overlap each successive strip of Nonwoven Geotextile 1000 mm over previously laid strip. When Nonwoven Geotextile is placed on a slope, ensure Nonwoven Geotextile placed higher on slope is placed above Nonwoven Geotextile placed lower on slope.
- .7 Pin successive strips of Nonwoven Geotextile with securing pins at 1000 mm interval at midpoint of lap.
- .8 Protect installed Nonwoven Geotextile material from displacement, damage or deterioration before, during and after placement of material layers. Nonwoven Geotextile shall be covered within sufficient time so that ultraviolet damage does not occur. In no case shall this time exceed seven (7) days.
- .9 Replace damaged or deteriorated Nonwoven Geotextile to approval of the Departmental Representative.
- .10 Construction equipment is not permitted on the Nonwoven Geotextile at any stage of construction.
- .11 Upon acceptance by the Departmental Representative, place succeeding material as shown on the Contract Drawings.

3.5 EMBANKMENT PLACEMENT

- .1 Schedule Embankment to facilitate roadway widening in conformance with Item 3.3 Sequence of Work in Section 01 11 10 – Summary of Work.
- .2 Place Embankment material in uniform layers not exceeding 400 mm compacted thickness to the design lines, grades, cross sections and dimensions shown on the Contract Drawings and in accordance with the following:
 - .1 Where required Embankment thickness is less than 400 mm in conformance with the lines and grades shown on the Contract Drawings, substitute Embankment – 300 mm Minus material with Embankment – 75 mm Minus material. Minimum thickness of Embankment – 300 mm Minus material shall not be less than 400 mm.



- .2 Where design lines and grades shown in the Contract Drawings require less than 400 mm thickness of Embankment, substitute Embankment – 300 mm Minus material
- .3 The Contractor shall place and compact Embankment material on the existing organic mat prior to freeze-up in Fall 2022, in accordance with Section 01 11 10 – Summary of Work, Item 3.3 Sequence of Work.
- .4 Should the Contractor not complete placement and compaction of Embankment material prior to freeze-up in Fall 2022, the Contractor shall strip organics in conformance with Item 3.6 of this specification section. Receive Departmental Representative approval prior to undertaking Stripping. Stripping shall not be measured for payment, and shall be considered incidental to the work.
- .3 When Embankment is placed on hillsides or where new fill is to be applied upon the existing embankment, the slopes of the embankment or original ground (except rock) shall be terraced in a continuous series of steps a minimum of 2.5 m wide as the Embankment rises.
- .4 Ensure material is placed is free of ice and snow, or as acceptable to the Departmental Representative, and has a maximum moisture content less than 4% when tested in accordance with ASTM D2216.
- .5 Place material only on clean surfaces, properly shaped and compacted, Nonwoven Geotextile installed, and free from snow and ice acceptable to the Departmental Representative.
- .6 Maintain sloped surface during construction to ensure ready run-off of surface water. Drain low areas before placing materials.
- .7 Begin spreading Embankment on high side of one-way slopes.
- .8 Place Embankment using methods which do not lead to segregation or degradation of the material.
- .9 Place and compact Embankment to full width in uniform layers not exceeding 400 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved. Compact each lift in accordance with the following:
 - .1 Where Embankment is free of frozen material and the air temperature during placement and compaction is greater than zero degrees Celsius (0°C):
 - .1 Compact to a density not less than 98% of the maximum dry density in accordance with ASTM D698. Calculate correction to maximum dry density in accordance with Section 31 05 10 – Corrected Maximum Dry Density.
 - .2 Apply water as necessary during compacting to obtain specified density. If Embankment is excessively moist, take remedial action to dry Embankment as accepted by the Departmental Representative.
 - .2 Where Embankment contains some frozen material acceptable to the Departmental Representative and/or the air temperature during placement or compaction is less than or equal to zero degrees Celsius (0°C), the moisture content of Embankment material when tested in accordance with ASTM D2216 shall be less than or equal to 4%, and compaction shall be undertaken as follows:
 - .1 Compact each lift of Embankment using the same equipment and rolling pattern used to achieve the maximum “Control Density” in accordance with Alberta Transportation ATT 58/96 Density Test, Control Strip Method.
- .10 Break material down to sizes that enable required compaction. Maximum size of material shall be 300 mm.



- .11 Shape Embankment to within 200 mm of design lines and grades, neither uniformly high or low. Finish slopes and ditch bottoms to neat condition, true to lines, grades and drawings where applicable.
- .12 Finished side slopes of Embankment material placed in frozen conditions shall be compacted with tracked equipment in unfrozen conditions during Summer 2023 construction.
- .13 Maintain finished surfaces in condition conforming to this Section until acceptance by Departmental Representative.

3.6 STRIPPING

- .1 Should the Contractor place Embankment material in frozen conditions in Winter 2022-23, and upon Departmental Representative's approval, complete Stripping of organic materials as directed by the Departmental Representative.
- .2 Limit extents of Stripping as much as possible to facilitate completion of the work.
- .3 Grub out stumps, roots and wood debris including roots and embedded logs not less than 200 mm below ground surface after completion of Stripping.
- .4 Remove and dispose offsite stripped materials to the ISSF Old Borrow Site (Town Pit) in conformance with Item 3.3 Hauling and Stockpiling of Excavation Materials of this specification section, and acceptable to the Departmental Representative.

3.7 RESTORATION

- .1 Remove haul roads, construction turnaround areas, temporary structures, access points / ramps, roads, detours, laydown areas, pads and all other works installed during access development to the satisfaction of the Departmental Representative and in accordance with Section 01 14 00 – Work Restrictions, Construction Staging, Access Development, and Restoration.

3.8 ROADWAY DUST CONTROL

- .1 Complete Roadway Dust Control using water over the full width of all utilized driving lanes whenever:
 - .1 Dust from travelling vehicles impairs driver's vision such that objects further than 150 m are obscured by dust.
 - .2 Deemed necessary by the Departmental Representative.

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for the supply, placement and compaction of Sub-Base Gravel will be made on the basis of the Price per Unit Bid for **“Sub-Base Gravel (Supply, Haul, Place, Compact)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with snow removal prior to placement (if required) and as required during construction to facilitate performance and inspection of the work, excavation, manufacture, temporary stockpiling (if required), loading, transport, placement, shaping, watering and/or drying, and compaction of the Sub-Base Gravel (in frozen and/or non-frozen conditions as required), dust control, and all other items necessary for successful completion of the work in accordance with these specifications.
- .2 Measurement for Payment for the supply, placement, and compaction of Sub-Base Gravel will be made on the volume of material surveyed in cubic metres, incorporated in the works (at the completion of shaping and compaction) and accepted by the Departmental Representative. Measurement for payment shall exclude Sub-Base Gravel used to infill ponding areas and used to construct ditch blocks.
- .3 Payment for Ponding Area Infill will be made on the basis of the Price per Unit Bid for **“Ponding Area Infill (Supply, Haul, Place)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the supply, haul, placement, and grading of Sub-Base Gravel in areas identified for ponding area infill, and all other items necessary for the successful completion of the work.
- .4 Measurement for Payment for Ponding Area Infill will be made on the volume of material surveyed in cubic metres, incorporated into the works (at the completion of placement and grading) and accepted by the Departmental Representative.
- .5 Payment for construction of ditch blocks will be made on the Basis of the Price per Unit Bid for **“Ditch Blocks (Supply, Haul, Place, Compact)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the supply, haul, placement, grading and compaction of Sub-Base Gravel as Ditch Blocks, and all other items necessary for the successful completion of the work.
- .6 Measurement for Payment for Ditch Blocks will be made on the count of each ditch block installed and accepted by the Departmental Representative.
- .7 Mobilization and demobilization required for this Work shall be incidental to **“Mobilization and Demobilization”** and no additional payment will be made.
- .8 Traffic management required for this Work shall be incidental to **“Traffic Management”** and no separate payment will be made to the Contractor.
- .9 Quality management required for this Work shall be incidental to **“Quality Management”** and no separate payment will be made to the Contractor.
- .10 Environmental mitigations, including but not limited to bird sweeps required in accordance with Section 01 35 43 – Environmental Protection, for the Work in this Section shall be incidental to the Contract and no separate payment will be made to the Contractor.

1.2 **DEFINITIONS**

- .1 Frozen Conditions: applies when the material or air temperature is less than or equal to zero degrees Celsius (0°C).



- .2 Unfrozen Conditions: applies when the material or air temperature is greater than zero degrees Celsius (0°C).

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM), latest editions.
 - .1 ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
 - .2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³)).
 - .3 ASTM D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- .2 Alberta Transportation Testing (ATT):
 - .1 ATT-58/96 Density Test, Control Strip Method.

PART 2 PRODUCTS

2.1 SUB-BASE GRAVEL

- .1 Sub-Base Gravel shall be in accordance with Section 31 05 16 – Aggregates: General.

2.2 NONWOVEN GEOTEXTILE

- .1 Nonwoven Geotextile shall be in accordance with Section 31 24 14 – Roadway Excavation, Embankment, and Compaction.

PART 3 EXECUTION

3.1 INSPECTION AND SURVEY OF UNDERLYING SURFACE

- .1 Complete required Common Excavation and installation of Nonwoven Geotextile in accordance with the Contract Drawings and Section 31 24 14 – Roadway Excavation, Embankment, and Compaction prior to placement of Sub-Base Gravel.
- .2 Place Sub-Base Gravel only after underlying surface has been surveyed by the Contractor, Nonwoven Geotextile has been installed, and the preceding work has been accepted by the Departmental Representative.

3.2 PLACING

- .1 Place Sub-Base Gravel to lines and grades shown on the Contract Drawings.
- .2 Ensure material placed is free of ice and snow, or as acceptable to the Departmental Representative, and has a maximum moisture content less than or equal to 4% when tested in accordance with ASTM D2216.
- .3 Place material only on clean surfaces, properly shaped and compacted, and free from snow and ice acceptable to the Departmental Representative.
- .4 Begin spreading Sub-Base Gravel on crown line or on high side of one-way slope.
- .5 Place Sub-Base Gravel material using methods which do not lead to segregation or degradation of the material.



- .6 Place material in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
- .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .8 Remove and replace segregated material.
- .9 Complete dust control using water as required throughout the work (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).

3.3 COMPACTION

- .1 Compact Sub-Base Gravel in accordance with the following:
 - .1 Where Sub-Base Gravel material is free of frozen material and the air temperature during placement and compaction is greater than zero degrees Celsius (0°C) (i.e., unfrozen conditions):
 - .1 Compact to a density not less than 98% of the maximum dry density in accordance with ASTM D698. Calculate correction to maximum dry density in accordance with Section 31 05 10 – Corrected Maximum Dry Density.
 - .2 Apply water as necessary during compacting to obtain specified density. If Sub-Base Gravel is excessively moist, take remedial action to dry Sub-Base Gravel as accepted by the Departmental Representative.
 - .2 Where Sub-Base Gravel contains some frozen material acceptable to the Departmental Representative and/or the air temperature during placement or compaction is less than or equal to zero degrees Celsius (0°C) (i.e., frozen conditions), the moisture content of Sub-Base Gravel when tested in accordance with ASTM D2216 shall be less than or equal to 4%, and compaction shall be undertaken as follows:
 - .1 Compact each lift of Sub-Base Gravel using the same equipment and rolling pattern used to achieve the maximum “Control Density” in accordance with Alberta Transportation ATT 58/96 Density Test, Control Strip Method.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted structure.
- .3 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by the Departmental Representative.
- .4 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 PONDING AREA INFILL

- .1 Infill existing ponding areas using Sub-Base Gravel in the locations and in accordance with Contract Drawings. Place and shape Sub-Base Gravel in accordance with this specification section.
- .2 Additional ponding areas identified during construction by the Departmental Representative, or additional ponding areas identified by the Contractor and accepted by the Departmental Representative, will be paid in accordance with the General Conditions.
- .3 This work to occur in non-frozen conditions when water is present in ponded areas.



3.5 DITCH BLOCKS

- .1 Supply and place Sub-Base Gravel as Ditch Blocks in the locations, and to the lines, grades and dimensions shown on the Contract Drawings.

3.6 TOLERANCES

- .1 Finished Sub-Base Gravel surface, following regrading and compaction, shall be within +/- 20 mm of the design lines and grades shown on the Contract Drawings, but not uniformly high or low.

3.7 PROTECTION

- .1 Maintain finished Sub-Base Gravel surface in a condition conforming to this specification section until acceptance by the Departmental Representative and succeeding material is applied. No separate payment will be made for maintenance.

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for supply, placement and compaction of Surfacing Gravel will be made on the basis of the Price per Unit Bid for **“Surfacing Gravel (Supply, Haul, Place, Compact)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with snow removal prior to placement (if required and as required during construction to facilitate inspection of the work, excavation, manufacture, temporary stockpiling, loading, transport, placement, shaping, watering and/or drying and compaction of the Surfacing Gravel, dust control, and all other items necessary for successful completion of the work in accordance with these specifications. The Price per Unit Bid shall further include supply, haul and placement of additional Surfacing Gravel (if required during Regrade and Recomposition in Summer) to achieve the lines, grades, and tolerance requirements of the Contract Drawings and these specifications.
- .2 Measurement for Payment for Surfacing Gravel will be made on the volume of material surveyed in cubic metres, incorporated in the works (at the completion of shaping and compaction) and accepted by the Departmental Representative.
- .3 Payment for regrading and recompacting Surfacing Gravel in non-frozen conditions will be made on the basis of the Lump Sum Bid for **“Surfacing Gravel (Regrade, Recompile)”** in the Bid and Acceptance Form. The Lump Sum Bid shall include all costs included with regrading and recompacting in unfrozen conditions the Surfacing Gravel previously placed and compacted in frozen conditions to the depth of 300 mm.
- .4 Measurement for Payment for regrading and recompacting Surfacing Gravel in non-frozen conditions will be made by Lump Sum based on the percentage of work completed and accepted by the Departmental Representative.
- .5 Payment for the supply and stockpiling of Surfacing Gravel for future maintenance will be made on the basis of the Price per Unit Bid for **“Surfacing Gravel for Maintenance (Supply, Haul, Stockpile)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with:
 - .1 Preparation of the stockpile site at the North Leg Terminus Maintenance Gravel Stockpile location shown on the Contract Drawings.
 - .2 Preparation of the subgrade underneath the stockpile shall consist of grading the area to an even flat surface..
 - .3 The maximum footprint allowed for the stockpile shall be cone with a maximum radius of 9m
 - .4 Excavation, manufacture, temporary stockpiling, loading, transport, unloading and stockpiling at the North Leg Terminus Maintenance Gravel Stockpile location.
 - .5 All materials, labour, equipment and any and all royalties / pit fees that be due to complete the work.
 - .6 Survey of the stockpile site prior to and upon completion of stockpiling Surfacing Gravel for the purpose of measuring stockpile volume.
 - .7 All items necessary for the successful completion of the work.
- .6 Measurement for Payment for supply and stockpiling of Surfacing Gravel for Maintenance will be by the volume of material stockpiled surveyed in cubic metres (volume comparison pre-stockpile and



post-stockpile survey), incorporated into the works (at the completion of stockpiling) and accepted by the Departmental Representative. The volume of Surfacing Gravel utilized by the Contractor for **“Surfacing Gravel (Regrade, Recompact)”** to achieve the lines, grades, and tolerances of the Contract Drawings and these specifications will be measured separated under the applicable payment item.

- .7 Mobilization and demobilization required for this Work shall be incidental to **“Mobilization and Demobilization”** and no additional payment will be made.
- .8 Traffic management and Quality management required for this Work shall be incidental to **“Quality Management and Traffic Management”** and no separate payment will be made to the contractor.
- .9 Environmental mitigations, including but not limited to bird sweeps required in accordance with Section 01 35 43 – Environmental Protection, for the Work in this Section shall be incidental to the Contract and no separate payment will be made to the Contractor.

1.2 DEFINITIONS

- .1 Frozen Conditions: applies when the material or air temperature is less than or equal to zero degrees Celsius (0°C).
- .2 Unfrozen Conditions: applies when the material or air temperature is greater than zero degrees Celsius (0°C).

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM), latest edition:
 - .1 ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 - .2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)).

PART 2 PRODUCTS

2.1 SURFACING GRAVEL

- .1 Surfacing Gravel shall be in accordance with Section 31 05 16 – Aggregates: General.

PART 3 EXECUTION

3.1 INSPECTION AND SURVEY OF UNDERLYING SURFACE

- .1 Place and compact required Sub-Base Gravel in accordance with the Contract Drawings and Section 32 11 19 – Sub-Base Gravel prior to placement of Surfacing Gravel.
- .2 Place Surfacing Gravel only after underlying surface has been surveyed by the Contractor, and the preceding work has been accepted by the Departmental Representative.

3.2 PLACING

- .1 Place Surfacing Gravel to the lines and grades shown on the Contract Drawings.



- .2 Ensure material placed is free of ice and snow, or as acceptable to the Departmental Representative, and has a maximum moisture content less than or equal to 4% when tested in accordance with ASTM D2216.
- .3 Place material only on clean surfaces, properly shaped and compacted, and free from snow and ice acceptable to the Departmental Representative.
- .4 Begin spreading Surfacing Gravel material on crown line or on high side of one-way slope.
- .5 Place Surfacing Gravel using methods which do not lead to segregation or degradation of the material.
- .6 Place material in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
- .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .8 Remove and replace segregated material.
- .9 Complete dust control using water as required throughout the work (see Section 31 24 14 – Roadway Excavation, Embankment, and Compaction).

3.3

COMPACTION

- .1 Compact Surfacing Gravel in accordance with the following:
 - .1 Where Surfacing Gravel is free of frozen material and the air temperature during placement and compaction is greater than zero degrees Celsius (0°C) (i.e., unfrozen conditions):
 - .1 Compact to a density not less than 100% of the maximum dry density in accordance with ASTM D698. Calculate correction to maximum dry density in accordance with Section 31 05 10 – Corrected Maximum Dry Density.
 - .2 Apply water as necessary during compacting to obtain specified density. If Surfacing Gravel is excessively moist, take remedial action to dry Surfacing Gravel as accepted by the Departmental Representative.
 - .2 Where Surfacing Gravel contains some frozen material acceptable to the Departmental Representative and/or the air temperature during placement and compaction is less than zero degrees Celsius (0°C) (i.e., frozen conditions):
 - .1 Compact each lift of Surfacing Gravel using the same equipment and rolling pattern used to achieve the maximum “Control Density” in accordance with Alberta Transportation ATT 58/96 Density Test, Control Strip Method.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted structure.
- .3 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by the Departmental Representative.
- .4 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.



3.4 REGRADING AND RECOMPACTING

- .1 Once unfrozen conditions are present at the site, the Contractor shall ensure the Surfacing Gravel achieves the lines and grades shown in the Contract Drawings, and meets the density requirements for unfrozen conditions in 3.3 Compaction.
- .2 Compact unfrozen Surfacing Gravel in accordance with the requirements of 3.3 Compaction of this specification section.
- .3 The Contractor shall supply additional Surfacing Gravel as required to ensure the tolerances outlined in 3.5 Tolerances are achieved. Supply of additional Surfacing Gravel shall be considered incidental to the payment item for “**Surfacing Gravel (Regrade, Recompact)**”. The Contractor shall not utilize “**Surfacing Gravel for Maintenance (Supply, Haul, Stockpile)**” for the purpose of achieving the design lines, grades, and tolerances for Surfacing Gravel placed by the Contractor.

3.5 TOLERANCES

- .1 When compacted, finished surfaces of Surfacing Gravel shall be within +/- 10 mm of the lines and grades shown on the Contract Drawings, but not uniformly high or low.

3.6 PROTECTION

- .1 Maintain finished Surfacing Gravel in condition conforming to this specification section until acceptance by the Departmental Representative. No separate payment will be made for maintenance.

3.7 SURFACING GRAVEL FOR MAINTENANCE

- .1 The Contractor shall produce Surfacing Gravel for future use / maintenance activities by the Departmental Representative.
- .2 Surfacing Gravel for Maintenance shall be manufactured, transported and stockpiled in accordance with Section 31 05 16 – Aggregates: General and the following:
 - .1 Stockpile Surfacing Gravel for Maintenance in the location(s) shown on the Contract Drawings.

END OF SECTION



PART 1 **GENERAL**

1.1 **MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for the excavation and disposal of existing culverts will be made on the basis of the Price per Unit Bid for **“Culverts – 800 mm Dia. CSP (Excavate, Dispose)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for dewatering (if required), excavation, loading, hauling, transport and offsite disposal of existing culverts and associated components, and all other items necessary for the successful completion of the work.
- .2 Measurement for Payment for the excavation and disposal of existing culverts will be made on the length of culvert excavated, removed and disposed offsite, surveyed in lineal metres, measured parallel to the direction of the existing culvert along the invert or crown of the culvert, and accepted by the Departmental Representative.
- .3 Payment for the installation of new aluminized CSP culverts will be made on the basis of the Price per Unit Bid for **“Culverts – 800 mm Dia. Aluminized CSP (Supply, Install)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the work including excavation, dewatering (if required), supply, transport and installation of Nonwoven Geotextile, supply, transport, and installation of aluminized CSP culvert, Culvert Bedding and Surround Material, cutting culverts to length (if required), zinc-rich paint, and all other items (couplings, fittings, and hardware), and all other items necessary for the successful completion of the work.
- .4 Measurement for Payment for the installation of new aluminized CSP culverts will be made on the length of culvert excavated, removed and disposed offsite, surveyed in lineal metres, measured parallel to the direction of the existing culvert along the invert or crown of the culvert, and accepted by the Departmental Representative.
- .5 Payment for culvert riprap end treatment will be made on the basis of the Price per Unit Bid for **“Culvert Riprap End Treatment (Excavate, Load, Haul, Place)”** in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with clearing and brushing of vegetation, excavation, dewatering (as required), loading, hauling and disposal of the excavated materials to the ISSF Old Borrow Site (Town Pit) in preparation for the riprap, supply, transport and installation of Nonwoven Geotextile, supply, loading, transport and placement of 10 kg Class Riprap, and all other items necessary for the successful completion of the work.
- .6 Measurement for Payment for culvert riprap end treatment will be made on the volume of riprap material placed, surveyed in cubic metres and accepted by the Departmental Representative.
- .7 Mobilization and demobilization required for this Work shall be incidental to **“Mobilization and Demobilization”** and no additional payment will be made.
- .8 Traffic management and Quality management required for this Work shall be incidental to **“Quality Management and Traffic Management”** and no separate payment will be made to the contractor.
- .9 Environmental mitigations, including but not limited to bird sweeps required in accordance with Section 01 35 43 – Environmental Protection, for the Work in this Section shall be incidental to the Contract and no separate payment will be made to the Contractor.

1.2 **REFERENCES**

- .1 Canadian Standards Association (CSA International).
 - .1 CSA-G401-01, Corrugated Steel Pipe Products.



- .2 American Society for Testing and Materials (ASTM), latest edition.
 - .1 ASTM C127, Standard Test Method for Relative Density (Specific Gravity) and Absorption of Course Aggregate.
 - .2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .3 ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
 - .1 Proposed Nonwoven Geotextile product information is to be provided to the Departmental Representative prior to commencing work.
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Handle and store pipe products in a manner to avoid damage, alteration, deterioration, and soiling.
- .2 Where the material supplied is damaged, the Contractor shall immediately separate nested sections of the plate or pipe to facilitate more detailed inspection by the Departmental Representative. Culvert material designated by the Departmental Representative as unacceptable, due to damage or failure to meet specified requirements, shall be immediately repaired or replaced by the Contractor to the acceptance of the Departmental Representative.

PART 2 **PRODUCTS**

2.1 ALUMINIZED CSP CULVERT

- .1 Aluminized CSP Culverts shall be CSP with an aluminum coating such as Armtec Hel-Cor Aluminized Steel Type 2 CSP culverts, Atlantic Industries Aluminized Type CSP culverts, or a pre-approved equivalent. All culverts used on the project shall conform to the following:
 - .1 Corrugated steel pipe: to CSA-G401.
 - .2 Culverts to be annular or spiral with annular ends. Coupling bands to be two-piece annular bolted with minimum width of nine (9) corrugations.
 - .3 Minimum wall thickness to be:
 - .1 2.0 mm.
 - .4 Corrugations to be.
 - .1 New Culvert Installations: 68 mm x 13 mm.
 - .2 Extensions to existing culverts shall match corrugation profile for the existing culvert. Contractor shall confirm existing culvert corrugations prior to ordering culverts material.



- .5 Aluminized Type 2 coating – provide 75-year service life in a low-abrasion environment with pH between 5 and 9 and resistivity above 1,500 ohm-cm.
 - .2 Ensure that all components for each particular Aluminized CSP Culvert comes from a single supplier.
- 2.2 ZINC-RICH PAINT**
 - .1 Zinc-rich paint shall be Galvacon™ or pre-approved equivalent.
- 2.3 CULVERT BEDDING AND SURROUND MATERIAL**
 - .1 Culvert Bedding and Surround Material shall be Sub-Base Gravel shall be in accordance with Section 31 05 16 – Aggregates: General.
- 2.4 RIPRAP**
 - .1 Riprap shall be in conformance with Section 31 05 16 – Aggregates: General.
- 2.5 NONWOVEN GEOTEXTILE**
 - .1 Nonwoven Geotextile shall be in accordance with Section 31 24 14 – Roadway Excavation, Embankment, and Compaction.
- PART 3 EXECUTION**
 - 3.1 GENERAL**
 - .1 Complete culvert installation and related works in conformance with the requirements of Section 01 35 43 – Environmental Protection.
 - .2 Culvert replacements / installations shall be completed in the dry or frozen conditions.
 - 3.2 EXISTING CULVERT REMOVAL**
 - .1 Excavate, remove and dispose of existing CSP culverts and associated components in the locations and extents shown on the Contract Drawings. Dispose of the culverts in an offsite disposal facility permitted to accept the culvert materials and acceptable to the Departmental Representative.
 - 3.3 CULVERT BEDDING AND SURROUND MATERIAL**
 - .1 Complete excavation and dewater excavation, as necessary, to allow placement of Culvert Bedding and Surround Material in dry condition. Excavate to the lines and grades shown on the Contract Drawings.
 - .1 Excavation required to facilitate installation of Culvert Bedding and Surround Material will not be measured for payment and will be considered incidental to the work.
 - .2 Place required Nonwoven Geotextile to the locations, lines and grades shown on the Contract Drawings and in conformance with Section 31 24 14 – Roadway Excavation, Embankment, and Compaction. Nonwoven Geotextile installed for culvert installations shall not be measured for payment and shall be considered incidental to the work.
 - .3 Place Culvert Bedding and Surround Material in preparation for culvert placement on bottom of excavation to the thickness and locations shown on Contract Drawings. Compact Culvert Bedding and Surround Material in accordance with the following:



- .1 Where Culvert Bedding and Surround Material is free of frozen material and the air temperature during placement and compaction is greater than zero degrees Celsius (0°C):
 - .1 Compact final 150 mm lift of Culvert Bedding and Surround Material on bottom side of culvert in contact with corrugation to a density not less than 95% of the standard maximum dry density in accordance with ASTM D698. Compact other lifts of Culvert Bedding and Surround Material to a density not less than 98% of the standard maximum dry density in accordance with ASTM D698. Calculate correction to maximum dry density in accordance with Section 31 05 10 – Corrected Maximum Dry Density.
 - .2 Apply water as necessary during compacting to obtain specified density. If Culvert Bedding and Surround Material is excessively moist, take remedial action to dry Culvert Bedding and Surround Material as accepted by the Departmental Representative.
- .2 Where Culvert Bedding and Surround Material contains some frozen material acceptable to the Departmental Representative and/or the air temperature during placement or compaction is less than or equal to zero degrees Celsius (0°C), the moisture content of the Culvert Bedding and Surround Material when tested in accordance with ASTM D2216 shall be less than or equal to 4%, and compaction shall be undertaken as follows:
 - .1 Compact each lift of Culvert Bedding and Surround Material using the same equipment and rolling pattern used to achieve the maximum "Control Density" in accordance with Alberta Transportation ATT 58/96 Density Test, Control Strip Method.
- .4 Shape Culvert Bedding and Surround Material to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with Culvert Bedding and Surround Material and to the camber as indicated on the Contract Drawings, free from sags or high points.

3.4 CULVERT PLACEMENT

- .1 Place culvert such that when complete the alignment, grade, camber, location, and inverts follow the alignment, grade, location, and inverts shown on the Contract Drawings.
- .2 Begin pipe placing at downstream end.
- .3 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.
- .4 Do not allow water to flow through pipes during construction except as permitted by Departmental Representative.

3.5 CULVERT JOINTS

- .1 Install culvert joints per the manufacture's recommendation.
- .2 Smooth all cut edges made by grinding so that all the burrs are removed.
- .3 Repair spots where damage has occurred to coating in the field by applying two (2) coats of zinc rich paint. Allow each coat to dry before placing second coat, or Culvert Bedding and Surround Material.

3.6 CULVERT BACKFILLING

- .1 Backfill around and over culverts as indicated on the Contract Drawings.



- .2 Place Culvert Bedding and Surround Material in 150 mm layers to full width, alternately on each side of culvert, so as not to allow movement or uplift of the culvert.
- .3 Compact each layer in accordance with 3.3 above taking special care to obtain required density under haunches. Hand tamp where necessary to obtain compaction.
- .4 Protect installed culvert with minimum 600 mm cover of compacted fill before heavy equipment is permitted to cross. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 2H:1V.

3.7 CULVERT RIPRAP END TREATMENT

- .1 Prior to or during installation of the culverts, clear and brush vegetation, and excavate ground to the lines and grades shown on the Contract Drawings to facilitate the installation of riprap for Culvert Riprap End Treatment. Ensure excavation will allow for positive drainage upon placement of riprap. Dispose of excavated material offsite at the ISSF Old Borrow Site (Town Pit).
 - .1 Excavation required to facilitate installation of culvert riprap end treatments will not be measured for payment and will be considered incidental to the work.
- .2 Install Nonwoven Geotextile and 10 kg Class Riprap to the lines and grades shown on the Contract Drawings. Nonwoven Geotextile installed for Culvert Riprap End Treatments will not be measured for payment and shall be considered incidental to the work.
- .3 Ensure positive drainage following riprap placement. Dress all riprap voids to ensure that the final surface is well keyed, densely placed, uniform, and allows for positive drainage. Ensure that all surface voids are filled, and all nonwoven geotextile is concealed by the riprap.

END OF SECTION



Section - APPENDICES

APPENDIX A – ON-SITE CONSTRUCTION START-UP FORM



On-site Construction Start-up Form

Project Name:			
Project Number:			
Departmental Representative:		Ph:	
Contractor:			
Contractor Representative:		Ph:	

The Contractor or its subcontractors shall not perform any on-site work until they receive a completed version of this form which has been signed by PSPC's Departmental Representative.

PSPC reserves the right to refuse payment for any on-site work performed prior to the receipt of the completed and signed form.

The list below is meant to be a guide and is not intended to be a comprehensive list of required submittal items for the project. Refer to Contract Documents and Contract Specifications for a Complete List.

Submission Item	Reviewed & Accepted by PSPC	Date (yyyy-mm-dd)	Comments / Exclusions
Contract, Bonding and Insurance	<input type="checkbox"/>		
Health & Safety Plan	<input type="checkbox"/>		
Traffic Management Plan	<input type="checkbox"/>		
Environmental Construction Operations Plan	<input type="checkbox"/>		
Project Construction Schedule	<input type="checkbox"/>		
Cash Flow Plan	<input type="checkbox"/>		
Quality Management Plan	<input type="checkbox"/>		
Construction Equipment List	<input type="checkbox"/>		
Other:	<input type="checkbox"/>		

Below to be completed by the Departmental Representative and returned to the Contractor

Has the Contractor submitted all required documents for construction work to commence? ☐ Yes ☐ No

Have all listed documents required prior to construction commencement been accepted by PSPC? ☐ Yes ☐ No

Comments (if applicable):

Name of Departmental Representative:

Signature:

Date (yyyy-mm-dd):



Section - APPENDICES

APPENDIX B – PROGRESS PAYMENT SUBMITTAL FORM



Progress Payment Submittal Form

Project Name:		
Project Number:		
Departmental Representative:		Ph:
Contractor:		
Contractor Representative:		Ph:

This form, completed and signed by the Contractor's Representative, shall be submitted with all documentation listed below for each progress payment request.

Upon receipt of this form and all documents, PSPC will commence review of the progress payment request in accordance with General Conditions 5 – Terms of Payment.

The list below is meant to be a guide and is not intended to be a comprehensive list of required submittal items for each progress payment. PSPC may request additional documentation not listed below.

Submission Item	Submitted	Comments
Progress Payment	<input type="checkbox"/>	
Statutory Declaration	<input type="checkbox"/>	
Project Schedule (with baseline tasks and updates showing completion dates and % complete)	<input type="checkbox"/>	
Updated Cash Flow Forecast	<input type="checkbox"/>	
Scale tickets for qty claimed	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	

Prime Contractor Representative:

Name:

Title:

Signature:

Date (yyyy-mm-dd):



Section - APPENDICES

APPENDIX C – GENERAL CONTRACTOR & SUB-CONTRACTOR CONSTRUCTION EQUIPMENT LIST



General Contractor & Sub-Contractor/s Construction Equipment List

Project Name: _____

Project Number:

Prime Contractor:

Sub-Contractor/s:

[illegible]



Section - APPENDICES

APPENDIX D – GRADE SHEETS

Corridor Section Points Report

Client:
ISSF Road Rehabilitation Project
PSPC / NRCAN

Date: 7/22/2022 9:13:12 AM

Corridor Name: L100-A1 - CORR
Description:
Base Alignment Name: L100-A1
Station Range: Start: 100+060.000, End: 100+840.000

Prepared by:
SM
Tetra Tech
TRN.VHWY - Vancouver

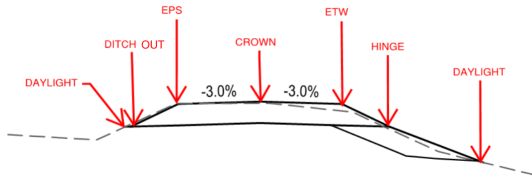
Grade Sheet Legend

Listing Legend

X = Northing
Y = Easting
Z = Elevation
Offset = Distance from Centerline
String Cut = Point Description

Point Description Legend

Daylight = Daylight Cut
Ditch Out = Subgrade Shoulder (Daylight Situation)
EPS = Finished Grade Shoulder
Crown = Centerline Finished Grade
ETW = Finished Grade Shoulder
Hinge = Subgrade Shoulder (Fill Situation)
Daylight = Toe of Slope



CHAINAGE 100+060.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,868.056	7,579,172.685	33.935	-4.583m	Daylight
2	558,868.254	7,579,172.582	33.935	-4.359m	Ditch_Out
3	558,869.682	7,579,171.840	34.740	-2.750m	EPS
4	558,872.122	7,579,170.571	34.833	0.000m	Crown
5	558,874.562	7,579,169.302	34.927	2.750m	ETW
6	558,875.808	7,579,168.654	34.225	4.154m	Ditch_Out
7	558,876.084	7,579,168.511	34.225	4.466m	Daylight

CHAINAGE 100+070.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,871.981	7,579,181.361	34.483	-4.613m	Daylight
2	558,872.216	7,579,181.268	34.483	-4.359m	Ditch_Out
3	558,873.713	7,579,180.676	35.288	-2.750m	EPS
4	558,876.270	7,579,179.665	35.381	0.000m	Crown
5	558,878.828	7,579,178.654	35.475	2.750m	ETW
6	558,880.134	7,579,178.138	34.773	4.154m	Hinge
7	558,881.124	7,579,177.746	34.347	5.219m	Daylight

CHAINAGE 100+080.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,875.112	7,579,190.357	34.930	-4.516m	Daylight
2	558,875.263	7,579,190.314	34.930	-4.359m	Ditch_Out
3	558,876.813	7,579,189.880	35.735	-2.750m	EPS
4	558,879.461	7,579,189.138	35.828	0.000m	Crown
5	558,882.109	7,579,188.395	35.922	2.750m	ETW
6	558,883.461	7,579,188.016	35.220	4.154m	Ditch_Out
7	558,883.686	7,579,187.953	35.220	4.388m	Daylight

CHAINAGE 100+090.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,877.147	7,579,199.664	35.270	-4.580m	Daylight
2	558,877.364	7,579,199.627	35.270	-4.359m	Ditch_Out
3	558,878.950	7,579,199.354	36.075	-2.750m	EPS
4	558,881.660	7,579,198.888	36.168	0.000m	Crown
5	558,884.370	7,579,198.422	36.262	2.750m	ETW
6	558,885.754	7,579,198.184	35.560	4.154m	Hinge
7	558,886.568	7,579,198.045	35.229	4.980m	Daylight

CHAINAGE 100+100.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,878.386	7,579,209.113	35.518	-4.468m	Daylight
2	558,878.495	7,579,209.106	35.518	-4.358m	Ditch_Out
3	558,880.100	7,579,208.998	36.322	-2.750m	EPS
4	558,882.844	7,579,208.814	36.414	0.000m	Crown
5	558,885.588	7,579,208.629	36.507	2.750m	ETW
6	558,886.990	7,579,208.535	35.805	4.155m	Hinge
7	558,887.898	7,579,208.474	35.440	5.066m	Daylight

CHAINAGE 100+110.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,878.772	7,579,218.852	35.882	-4.331m	Daylight
2	558,878.821	7,579,218.851	35.882	-4.281m	Ditch_Out
3	558,880.352	7,579,218.836	36.648	-2.750m	EPS
4	558,883.102	7,579,218.808	36.676	0.000m	Crown
5	558,885.852	7,579,218.781	36.704	2.750m	ETW
6	558,887.322	7,579,218.766	35.970	4.220m	Hinge
7	558,888.133	7,579,218.758	35.645	5.031m	Daylight

CHAINAGE 100+120.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,878.960	7,579,228.850	36.284	-4.242m	Daylight
2	558,878.991	7,579,228.850	36.284	-4.212m	Ditch_Out
3	558,880.452	7,579,228.835	37.015	-2.750m	EPS
4	558,883.202	7,579,228.808	36.979	0.000m	Crown
5	558,885.952	7,579,228.781	36.943	2.750m	ETW
6	558,887.492	7,579,228.765	36.172	4.291m	Hinge
7	558,888.164	7,579,228.758	35.904	4.962m	Daylight

CHAINAGE 100+130.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,879.117	7,579,239.150	36.603	-4.433m	Daylight
2	558,879.395	7,579,239.128	36.714	-4.154m	Hinge
3	558,880.795	7,579,239.017	37.416	-2.750m	ETW
4	558,883.536	7,579,238.800	37.323	0.000m	Crown
5	558,886.278	7,579,238.582	37.229	2.750m	ETW
6	558,887.882	7,579,238.455	36.425	4.359m	Hinge
7	558,888.590	7,579,238.399	36.141	5.069m	Daylight

CHAINAGE 100+140.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,880.656	7,579,249.476	37.097	-4.248m	Daylight
2	558,880.747	7,579,249.460	37.097	-4.154m	Ditch_Out
3	558,882.129	7,579,249.206	37.800	-2.750m	EPS
4	558,884.834	7,579,248.711	37.706	0.000m	Crown
5	558,887.539	7,579,248.215	37.613	2.750m	ETW
6	558,889.122	7,579,247.925	36.808	4.359m	Ditch_Out
7	558,889.230	7,579,247.905	36.808	4.469m	Daylight

CHAINAGE 100+150.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,882.982	7,579,259.647	37.490	-4.325m	Daylight
2	558,883.146	7,579,259.599	37.490	-4.154m	Ditch_Out
3	558,884.494	7,579,259.207	38.193	-2.750m	EPS
4	558,887.135	7,579,258.438	38.099	0.000m	Crown
5	558,889.775	7,579,257.669	38.006	2.750m	ETW
6	558,891.320	7,579,257.220	37.201	4.359m	Ditch_Out
7	558,891.345	7,579,257.212	37.201	4.386m	Daylight

CHAINAGE 100+160.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,886.305	7,579,269.547	37.834	-4.434m	Daylight
2	558,886.564	7,579,269.442	37.834	-4.154m	Ditch_Out
3	558,887.866	7,579,268.914	38.536	-2.750m	EPS
4	558,890.414	7,579,267.880	38.442	0.000m	Crown
5	558,892.962	7,579,266.847	38.349	2.750m	ETW
6	558,894.454	7,579,266.242	37.544	4.359m	Ditch_Out
7	558,894.647	7,579,266.164	37.544	4.568m	Daylight

CHAINAGE 100+170.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,890.960	7,579,278.889	38.093	-4.163m	Daylight
2	558,890.967	7,579,278.885	38.093	-4.154m	Ditch_Out
3	558,892.208	7,579,278.227	38.795	-2.750m	EPS
4	558,894.638	7,579,276.940	38.702	0.000m	Crown
5	558,897.068	7,579,275.652	38.608	2.750m	ETW
6	558,898.490	7,579,274.898	37.804	4.359m	Ditch_Out
7	558,898.582	7,579,274.849	37.804	4.464m	Daylight

CHAINAGE 100+180.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,894.655	7,579,288.937	37.472	-6.145m	Daylight
2	558,896.310	7,579,287.831	38.268	-4.154m	Hinge
3	558,897.477	7,579,287.050	38.970	-2.750m	ETW
4	558,899.763	7,579,285.521	38.877	0.000m	Crown
5	558,902.049	7,579,283.993	38.783	2.750m	ETW
6	558,903.387	7,579,283.098	37.979	4.359m	Ditch_Out
7	558,903.832	7,579,282.801	37.979	4.895m	Daylight

CHAINAGE 100+190.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,900.917	7,579,297.525	37.534	-6.255m	Daylight
2	558,902.536	7,579,296.185	38.374	-4.154m	Hinge
3	558,903.618	7,579,295.290	39.077	-2.750m	ETW
4	558,905.736	7,579,293.536	38.983	0.000m	Crown
5	558,907.854	7,579,291.783	38.890	2.750m	ETW
6	558,909.094	7,579,290.757	38.085	4.359m	Ditch_Out
7	558,909.743	7,579,290.220	38.085	5.201m	Daylight

CHAINAGE 100+200.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	558,907.808	7,579,305.663	37.463	-6.681m	Daylight
2	558,909.580	7,579,303.863	38.473	-4.154m	Hinge
3	558,910.565	7,579,302.862	39.176	-2.750m	ETW
4	558,912.494	7,579,300.901	39.082	0.000m	Crown
5	558,914.423	7,579,298.941	38.989	2.750m	ETW
6	558,915.552	7,579,297.794	38.184	4.359m	Ditch_Out
7	558,916.351	7,579,296.982	38.184	5.499m	Daylight

CHAINAGE 100+210.000

POINT	X	Y	Z	OFFSET	STRING CUT
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1	558,916.867	7,579,311.343	38.234	-4.904m	Daylight
2	558,917.318	7,579,310.790	38.519	-4.190m	Hinge
3	558,918.228	7,579,309.674	39.239	-2.750m	ETW
4	558,919.965	7,579,307.542	39.181	0.000m	Crown
5	558,921.702	7,579,305.411	39.099	2.750m	ETW
6	558,922.710	7,579,304.174	38.301	4.346m	Ditch_Out
7	558,923.064	7,579,303.740	38.301	4.905m	Daylight
CHAINAGE 100+220.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,924.614	7,579,317.667	38.269	-4.911m	Daylight
2	558,925.034	7,579,317.152	38.535	-4.247m	Hinge
3	558,925.979	7,579,315.992	39.283	-2.750m	ETW
4	558,927.717	7,579,313.860	39.281	0.000m	Crown
5	558,929.454	7,579,311.728	39.198	2.750m	ETW
6	558,930.462	7,579,310.491	38.400	4.346m	Ditch_Out
7	558,930.682	7,579,310.222	38.400	4.694m	Daylight
CHAINAGE 100+230.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,932.597	7,579,323.701	38.548	-4.546m	Daylight
2	558,932.746	7,579,323.518	38.548	-4.309m	Ditch_Out
3	558,933.731	7,579,322.309	39.328	-2.750m	EPS
4	558,935.468	7,579,320.177	39.380	0.000m	Crown
5	558,937.206	7,579,318.046	39.297	2.750m	ETW
6	558,938.214	7,579,316.809	38.499	4.346m	Ditch_Out
7	558,938.411	7,579,316.567	38.500	4.657m	Daylight
CHAINAGE 100+240.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,940.283	7,579,330.099	38.605	-4.649m	Daylight
2	558,940.475	7,579,329.863	38.605	-4.346m	Ditch_Out
3	558,941.483	7,579,328.626	39.403	-2.750m	EPS
4	558,943.220	7,579,326.495	39.486	0.000m	Crown
5	558,944.958	7,579,324.363	39.403	2.750m	ETW
6	558,945.966	7,579,323.126	38.605	4.346m	Ditch_Out
7	558,946.052	7,579,323.019	38.605	4.483m	Daylight
CHAINAGE 100+250.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,948.214	7,579,336.197	38.755	-4.366m	Daylight
2	558,948.227	7,579,336.181	38.755	-4.346m	Ditch_Out
3	558,949.235	7,579,334.944	39.553	-2.750m	EPS
4	558,950.972	7,579,332.812	39.635	0.000m	Crown
5	558,952.709	7,579,330.680	39.553	2.750m	ETW
6	558,953.717	7,579,329.443	38.755	4.346m	Hinge
7	558,954.315	7,579,328.710	38.376	5.291m	Daylight
CHAINAGE 100+260.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,955.864	7,579,342.638	38.954	-4.527m	Daylight
2	558,955.978	7,579,342.498	38.954	-4.346m	Ditch_Out
3	558,956.986	7,579,341.261	39.752	-2.750m	EPS
4	558,958.724	7,579,339.130	39.834	0.000m	Crown
5	558,960.461	7,579,336.998	39.752	2.750m	ETW
6	558,961.469	7,579,335.761	38.954	4.346m	Hinge
7	558,962.113	7,579,334.970	38.546	5.366m	Daylight
CHAINAGE 100+270.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,963.508	7,579,349.089	39.196	-4.698m	Daylight
2	558,963.730	7,579,348.816	39.196	-4.346m	Ditch_Out
3	558,964.738	7,579,347.579	39.994	-2.750m	EPS
4	558,966.476	7,579,345.447	40.076	0.000m	Crown
5	558,968.213	7,579,343.315	39.994	2.750m	ETW
6	558,969.221	7,579,342.078	39.196	4.346m	Hinge
7	558,969.875	7,579,341.276	38.782	5.380m	Daylight
CHAINAGE 100+280.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,971.202	7,579,355.476	39.444	-4.789m	Daylight
2	558,971.482	7,579,355.133	39.444	-4.346m	Ditch_Out
3	558,972.490	7,579,353.896	40.242	-2.750m	EPS
4	558,974.227	7,579,351.764	40.324	0.000m	Crown
5	558,975.965	7,579,349.633	40.242	2.750m	ETW
6	558,976.973	7,579,348.396	39.444	4.346m	Hinge
7	558,977.528	7,579,347.714	39.092	5.225m	Daylight
CHAINAGE 100+290.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,978.946	7,579,361.804	39.692	-4.802m	Daylight
2	558,979.234	7,579,361.451	39.692	-4.346m	Ditch_Out
3	558,980.242	7,579,360.214	40.490	-2.750m	EPS

4	558,981.979	7,579,358.082	40.573	0.000m	Crown
5	558,983.716	7,579,355.950	40.490	2.750m	ETW
6	558,984.725	7,579,354.713	39.692	4.346m	Hinge
7	558,985.090	7,579,354.264	39.461	4.925m	Daylight
CHAINAGE 100+300.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,986.766	7,579,368.037	39.940	-4.693m	Daylight
2	558,986.985	7,579,367.768	39.940	-4.346m	Ditch_Out
3	558,987.994	7,579,366.531	40.738	-2.750m	EPS
4	558,989.731	7,579,364.399	40.821	0.000m	Crown
5	558,991.468	7,579,362.268	40.738	2.750m	ETW
6	558,992.476	7,579,361.031	39.940	4.346m	Hinge
7	558,992.927	7,579,360.478	39.655	5.059m	Daylight
CHAINAGE 100+310.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	558,994.540	7,579,374.328	40.188	-4.658m	Daylight
2	558,994.737	7,579,374.085	40.188	-4.346m	Ditch_Out
3	558,995.745	7,579,372.848	40.986	-2.750m	EPS
4	558,997.483	7,579,370.717	41.069	0.000m	Crown
5	558,999.220	7,579,368.585	40.986	2.750m	ETW
6	559,000.228	7,579,367.348	40.188	4.346m	Hinge
7	559,000.975	7,579,366.431	39.715	5.529m	Daylight
CHAINAGE 100+320.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,002.305	7,579,380.629	40.437	-4.637m	Daylight
2	559,002.489	7,579,380.403	40.437	-4.346m	Ditch_Out
3	559,003.497	7,579,379.166	41.234	-2.750m	EPS
4	559,005.234	7,579,377.034	41.317	0.000m	Crown
5	559,006.972	7,579,374.902	41.234	2.750m	ETW
6	559,007.980	7,579,373.665	40.437	4.346m	Hinge
7	559,008.756	7,579,372.713	39.945	5.574m	Daylight
CHAINAGE 100+330.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,009.979	7,579,387.042	40.685	-4.761m	Daylight
2	559,010.241	7,579,386.720	40.685	-4.346m	Ditch_Out
3	559,011.249	7,579,385.483	41.483	-2.750m	EPS
4	559,012.986	7,579,383.352	41.565	0.000m	Crown
5	559,014.724	7,579,381.220	41.483	2.750m	ETW
6	559,015.732	7,579,379.983	40.685	4.346m	Hinge
7	559,016.133	7,579,379.490	40.431	4.981m	Daylight
CHAINAGE 100+340.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,017.668	7,579,393.436	40.933	-4.860m	Daylight
2	559,017.993	7,579,393.038	40.933	-4.346m	Ditch_Out
3	559,019.001	7,579,391.801	41.731	-2.750m	EPS
4	559,020.738	7,579,389.669	41.813	0.000m	Crown
5	559,022.475	7,579,387.537	41.731	2.750m	ETW
6	559,023.483	7,579,386.300	40.933	4.346m	Hinge
7	559,023.553	7,579,386.215	40.889	4.456m	Daylight
CHAINAGE 100+350.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,025.652	7,579,399.469	41.170	-4.492m	Daylight
2	559,025.744	7,579,399.355	41.170	-4.346m	Ditch_Out
3	559,026.752	7,579,398.118	41.968	-2.750m	EPS
4	559,028.490	7,579,395.986	42.050	0.000m	Crown
5	559,030.227	7,579,393.855	41.968	2.750m	ETW
6	559,031.235	7,579,392.618	41.170	4.346m	Hinge
7	559,031.359	7,579,392.466	41.092	4.542m	Daylight
CHAINAGE 100+360.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,033.475	7,579,405.698	41.363	-4.379m	Daylight
2	559,033.496	7,579,405.673	41.363	-4.346m	Ditch_Out
3	559,034.504	7,579,404.436	42.161	-2.750m	EPS
4	559,036.242	7,579,402.304	42.243	0.000m	Crown
5	559,037.979	7,579,400.172	42.161	2.750m	ETW
6	559,038.987	7,579,398.935	41.363	4.346m	Hinge
7	559,039.326	7,579,398.519	41.148	4.882m	Daylight
CHAINAGE 100+370.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,041.141	7,579,412.121	41.509	-4.515m	Daylight
2	559,041.248	7,579,411.990	41.509	-4.346m	Ditch_Out
3	559,042.256	7,579,410.753	42.307	-2.750m	EPS
4	559,043.993	7,579,408.621	42.390	0.000m	Crown
5	559,045.731	7,579,406.490	42.307	2.750m	ETW
6	559,046.739	7,579,405.253	41.509	4.346m	Hinge

7	559,048.172	7,579,403.493	40.602	6.615m	Daylight
CHAINAGE 100+380.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,048.790	7,579,418.565	41.626	-4.678m	Daylight
2	559,049.000	7,579,418.307	41.626	-4.346m	Ditch_Out
3	559,050.008	7,579,417.070	42.424	-2.750m	EPS
4	559,051.745	7,579,414.939	42.506	0.000m	Crown
5	559,053.482	7,579,412.807	42.424	2.750m	ETW
6	559,054.490	7,579,411.570	41.626	4.346m	Hinge
7	559,055.855	7,579,409.895	40.762	6.506m	Daylight
CHAINAGE 100+390.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,056.184	7,579,425.321	41.794	-5.244m	Daylight
2	559,056.751	7,579,424.625	41.794	-4.346m	Ditch_Out
3	559,057.760	7,579,423.388	42.592	-2.750m	EPS
4	559,059.497	7,579,421.256	42.674	0.000m	Crown
5	559,061.234	7,579,419.124	42.592	2.750m	ETW
6	559,062.242	7,579,417.887	41.794	4.346m	Hinge
7	559,063.567	7,579,416.262	40.955	6.443m	Daylight
CHAINAGE 100+400.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,063.790	7,579,431.818	42.027	-5.475m	Daylight
2	559,064.503	7,579,430.942	42.027	-4.346m	Ditch_Out
3	559,065.511	7,579,429.705	42.824	-2.750m	EPS
4	559,067.249	7,579,427.574	42.907	0.000m	Crown
5	559,068.986	7,579,425.442	42.824	2.750m	ETW
6	559,069.994	7,579,424.205	42.027	4.346m	Hinge
7	559,071.334	7,579,422.561	41.178	6.467m	Daylight
CHAINAGE 100+410.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,071.455	7,579,438.241	42.319	-5.612m	Daylight
2	559,072.255	7,579,437.260	42.319	-4.346m	Ditch_Out
3	559,073.263	7,579,436.023	43.117	-2.750m	EPS
4	559,075.000	7,579,433.891	43.200	0.000m	Crown
5	559,076.738	7,579,431.759	43.117	2.750m	ETW
6	559,077.746	7,579,430.522	42.319	4.346m	Ditch_Out
7	559,077.917	7,579,430.312	42.319	4.617m	Daylight
CHAINAGE 100+420.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,079.114	7,579,444.673	42.615	-5.760m	Daylight
2	559,080.007	7,579,443.577	42.615	-4.346m	Ditch_Out
3	559,081.015	7,579,442.340	43.413	-2.750m	EPS
4	559,082.752	7,579,440.208	43.496	0.000m	Crown
5	559,084.489	7,579,438.077	43.413	2.750m	ETW
6	559,085.498	7,579,436.840	42.615	4.346m	Ditch_Out
7	559,086.439	7,579,435.685	42.615	5.836m	Daylight
CHAINAGE 100+430.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,087.458	7,579,450.264	42.855	-4.822m	Daylight
2	559,087.759	7,579,449.895	42.855	-4.346m	Ditch_Out
3	559,088.767	7,579,448.658	43.653	-2.750m	ETW
4	559,090.504	7,579,446.526	43.736	0.000m	Crown
5	559,092.241	7,579,444.394	43.653	2.750m	ETW
CHAINAGE 100+440.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,095.331	7,579,456.432	43.032	-4.629m	Daylight
2	559,095.510	7,579,456.212	43.032	-4.346m	Ditch_Out
3	559,096.518	7,579,454.975	43.830	-2.750m	ETW
4	559,098.256	7,579,452.843	43.913	0.000m	Crown
5	559,099.993	7,579,450.712	43.830	2.750m	ETW
CHAINAGE 100+450.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,103.187	7,579,462.622	43.154	-4.465m	Daylight
2	559,103.262	7,579,462.529	43.154	-4.346m	Ditch_Out
3	559,104.270	7,579,461.292	43.952	-2.750m	EPS
4	559,106.008	7,579,459.161	44.034	0.000m	Crown
5	559,107.745	7,579,457.029	43.952	2.750m	ETW
6	559,108.753	7,579,455.792	43.154	4.346m	Ditch_Out
7	559,109.849	7,579,454.447	43.154	6.081m	Daylight
CHAINAGE 100+460.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,110.962	7,579,468.911	43.276	-4.428m	Daylight
2	559,111.014	7,579,468.847	43.276	-4.346m	Ditch_Out
3	559,112.022	7,579,467.610	44.074	-2.750m	EPS

4	559,113.759	7,579,465.478	44.157	0.000m	Crown
5	559,115.497	7,579,463.346	44.074	2.750m	ETW
6	559,116.505	7,579,462.109	43.276	4.346m	Hinge
7	559,116.993	7,579,461.510	42.967	5.118m	Daylight
CHAINAGE 100+470.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,118.482	7,579,475.513	43.421	-4.795m	Daylight
2	559,118.766	7,579,475.164	43.421	-4.346m	Ditch_Out
3	559,119.774	7,579,473.927	44.219	-2.750m	EPS
4	559,121.511	7,579,471.796	44.301	0.000m	Crown
5	559,123.248	7,579,469.664	44.219	2.750m	ETW
6	559,124.256	7,579,468.427	43.421	4.346m	Hinge
7	559,125.946	7,579,466.354	42.351	7.020m	Daylight
CHAINAGE 100+480.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,125.996	7,579,482.122	43.588	-5.171m	Daylight
2	559,126.517	7,579,481.482	43.587	-4.346m	Ditch_Out
3	559,127.526	7,579,480.245	44.385	-2.750m	EPS
4	559,129.263	7,579,478.113	44.468	0.000m	Crown
5	559,131.000	7,579,475.981	44.385	2.750m	ETW
6	559,132.008	7,579,474.744	43.587	4.346m	Hinge
7	559,133.448	7,579,472.978	42.676	6.625m	Daylight
CHAINAGE 100+490.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,133.759	7,579,488.426	43.769	-5.154m	Daylight
2	559,134.269	7,579,487.799	43.769	-4.346m	Ditch_Out
3	559,135.277	7,579,486.562	44.567	-2.750m	EPS
4	559,137.015	7,579,484.430	44.649	0.000m	Crown
5	559,138.752	7,579,482.299	44.567	2.750m	ETW
6	559,139.760	7,579,481.062	43.769	4.346m	Hinge
7	559,141.043	7,579,479.488	42.956	6.376m	Daylight
CHAINAGE 100+500.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,141.645	7,579,494.578	43.950	-4.941m	Daylight
2	559,142.021	7,579,494.117	43.950	-4.346m	Ditch_Out
3	559,143.029	7,579,492.880	44.748	-2.750m	EPS
4	559,144.766	7,579,490.748	44.831	0.000m	Crown
5	559,146.504	7,579,488.616	44.748	2.750m	ETW
6	559,147.512	7,579,487.379	43.950	4.346m	Hinge
7	559,148.523	7,579,486.139	43.310	5.946m	Daylight
CHAINAGE 100+510.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,149.462	7,579,500.816	44.132	-4.838m	Daylight
2	559,149.773	7,579,500.434	44.132	-4.346m	Ditch_Out
3	559,150.781	7,579,499.197	44.930	-2.750m	EPS
4	559,152.518	7,579,497.065	45.012	0.000m	Crown
5	559,154.255	7,579,494.934	44.930	2.750m	ETW
6	559,155.264	7,579,493.697	44.132	4.346m	Hinge
7	559,156.235	7,579,492.505	43.517	5.884m	Daylight
CHAINAGE 100+520.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,157.209	7,579,507.139	44.313	-4.846m	Daylight
2	559,157.525	7,579,506.752	44.313	-4.346m	Ditch_Out
3	559,158.533	7,579,505.515	45.111	-2.750m	EPS
4	559,160.270	7,579,503.383	45.194	0.000m	Crown
5	559,162.007	7,579,501.251	45.111	2.750m	ETW
6	559,163.015	7,579,500.014	44.313	4.346m	Ditch_Out
7	559,163.138	7,579,499.863	44.313	4.540m	Daylight
CHAINAGE 100+530.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,164.969	7,579,513.446	44.495	-4.832m	Daylight
2	559,165.276	7,579,513.069	44.495	-4.346m	Ditch_Out
3	559,166.284	7,579,511.832	45.293	-2.750m	EPS
4	559,168.022	7,579,509.700	45.375	0.000m	Crown
5	559,169.759	7,579,507.568	45.293	2.750m	ETW
6	559,170.767	7,579,506.331	44.495	4.346m	Ditch_Out
7	559,171.033	7,579,506.005	44.495	4.767m	Daylight
CHAINAGE 100+540.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,172.748	7,579,519.730	44.676	-4.789m	Daylight
2	559,173.028	7,579,519.386	44.676	-4.346m	Ditch_Out
3	559,174.036	7,579,518.149	45.474	-2.750m	EPS
4	559,175.774	7,579,516.018	45.557	0.000m	Crown
5	559,177.511	7,579,513.886	45.474	2.750m	ETW
6	559,178.519	7,579,512.649	44.676	4.346m	Ditch_Out

7	559,178.706	7,579,512.419	44.676	4.642m	Daylight
CHAINAGE 100+550.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,180.501	7,579,526.046	44.858	-4.787m	Daylight
2	559,180.780	7,579,525.704	44.858	-4.346m	Ditch_Out
3	559,181.788	7,579,524.467	45.656	-2.750m	EPS
4	559,183.525	7,579,522.335	45.738	0.000m	Crown
5	559,185.263	7,579,520.203	45.656	2.750m	ETW
6	559,186.271	7,579,518.966	44.858	4.346m	Ditch_Out
7	559,186.451	7,579,518.746	44.858	4.631m	Daylight
CHAINAGE 100+560.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,188.241	7,579,532.377	45.042	-4.805m	Daylight
2	559,188.532	7,579,532.021	45.042	-4.346m	Ditch_Out
3	559,189.540	7,579,530.784	45.840	-2.750m	EPS
4	559,191.277	7,579,528.653	45.922	0.000m	Crown
5	559,193.014	7,579,526.521	45.840	2.750m	ETW
6	559,194.022	7,579,525.284	45.042	4.346m	Ditch_Out
7	559,194.448	7,579,524.762	45.042	5.019m	Daylight
CHAINAGE 100+570.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,196.010	7,579,538.674	45.247	-4.778m	Daylight
2	559,196.283	7,579,538.339	45.247	-4.346m	Ditch_Out
3	559,197.292	7,579,537.102	46.045	-2.750m	EPS
4	559,199.029	7,579,534.970	46.127	0.000m	Crown
5	559,200.766	7,579,532.838	46.045	2.750m	ETW
6	559,201.774	7,579,531.601	45.247	4.346m	Ditch_Out
7	559,202.378	7,579,530.860	45.247	5.302m	Daylight
CHAINAGE 100+580.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,203.813	7,579,544.929	45.476	-4.697m	Daylight
2	559,204.035	7,579,544.656	45.476	-4.346m	Ditch_Out
3	559,205.043	7,579,543.419	46.274	-2.750m	EPS
4	559,206.781	7,579,541.287	46.356	0.000m	Crown
5	559,208.518	7,579,539.156	46.274	2.750m	ETW
6	559,209.526	7,579,537.919	45.476	4.346m	Ditch_Out
7	559,209.892	7,579,537.469	45.476	4.925m	Daylight
CHAINAGE 100+590.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,211.588	7,579,551.218	45.729	-4.661m	Daylight
2	559,211.787	7,579,550.974	45.729	-4.346m	Ditch_Out
3	559,212.795	7,579,549.737	46.527	-2.750m	EPS
4	559,214.532	7,579,547.605	46.609	0.000m	Crown
5	559,216.270	7,579,545.473	46.527	2.750m	ETW
6	559,217.278	7,579,544.236	45.729	4.346m	Ditch_Out
7	559,217.428	7,579,544.052	45.729	4.583m	Daylight
CHAINAGE 100+600.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,219.310	7,579,557.572	46.006	-4.708m	Daylight
2	559,219.539	7,579,557.291	46.006	-4.346m	Ditch_Out
3	559,220.547	7,579,556.054	46.804	-2.750m	EPS
4	559,222.284	7,579,553.922	46.887	0.000m	Crown
5	559,224.021	7,579,551.791	46.804	2.750m	ETW
6	559,225.030	7,579,550.554	46.006	4.346m	Ditch_Out
7	559,225.187	7,579,550.360	46.006	4.595m	Daylight
CHAINAGE 100+610.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,227.081	7,579,563.866	46.305	-4.678m	Daylight
2	559,227.291	7,579,563.608	46.305	-4.346m	Ditch_Out
3	559,228.299	7,579,562.371	47.103	-2.750m	EPS
4	559,230.036	7,579,560.240	47.185	0.000m	Crown
5	559,231.773	7,579,558.108	47.103	2.750m	ETW
6	559,232.781	7,579,556.871	46.305	4.346m	Ditch_Out
7	559,232.868	7,579,556.765	46.305	4.483m	Daylight
CHAINAGE 100+620.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,234.894	7,579,570.108	46.607	-4.581m	Daylight
2	559,235.042	7,579,569.926	46.607	-4.346m	Ditch_Out
3	559,236.050	7,579,568.689	47.405	-2.750m	EPS
4	559,237.788	7,579,566.557	47.487	0.000m	Crown
5	559,239.525	7,579,564.425	47.405	2.750m	ETW
6	559,240.533	7,579,563.188	46.607	4.346m	Hinge
7	559,241.559	7,579,561.929	45.957	5.970m	Daylight
CHAINAGE 100+630.000					

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,242.764	7,579,576.281	46.909	-4.394m	Daylight
2	559,242.794	7,579,576.243	46.909	-4.346m	Ditch_Out
3	559,243.802	7,579,575.006	47.707	-2.750m	EPS
4	559,245.540	7,579,572.875	47.789	0.000m	Crown
5	559,247.277	7,579,570.743	47.707	2.750m	ETW
6	559,248.285	7,579,569.506	46.909	4.346m	Ditch_Out
7	559,248.286	7,579,569.504	46.909	4.348m	Daylight

CHAINAGE 100+640.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,249.552	7,579,583.780	46.582	-5.919m	Daylight
2	559,250.546	7,579,582.561	47.211	-4.346m	Hinge
3	559,251.554	7,579,581.324	48.009	-2.750m	ETW
4	559,253.291	7,579,579.192	48.091	0.000m	Crown
5	559,255.029	7,579,577.060	48.009	2.750m	ETW
6	559,256.037	7,579,575.823	47.211	4.346m	Hinge
7	559,257.171	7,579,574.431	46.492	6.142m	Daylight

CHAINAGE 100+650.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,258.238	7,579,588.951	47.513	-4.440m	Daylight
2	559,258.298	7,579,588.878	47.513	-4.346m	Ditch_Out
3	559,259.306	7,579,587.641	48.311	-2.750m	EPS
4	559,261.043	7,579,585.509	48.393	0.000m	Crown
5	559,262.780	7,579,583.378	48.311	2.750m	ETW
6	559,263.788	7,579,582.141	47.513	4.346m	Hinge
7	559,265.223	7,579,580.380	46.604	6.617m	Daylight

CHAINAGE 100+660.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,265.935	7,579,595.336	47.815	-4.527m	Daylight
2	559,266.049	7,579,595.196	47.815	-4.346m	Ditch_Out
3	559,267.058	7,579,593.959	48.613	-2.750m	EPS
4	559,268.795	7,579,591.827	48.695	0.000m	Crown
5	559,270.532	7,579,589.695	48.613	2.750m	ETW
6	559,271.540	7,579,588.458	47.815	4.346m	Hinge
7	559,272.908	7,579,586.780	46.949	6.510m	Daylight

CHAINAGE 100+670.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,273.675	7,579,601.668	48.117	-4.546m	Daylight
2	559,273.801	7,579,601.513	48.117	-4.346m	Ditch_Out
3	559,274.809	7,579,600.276	48.915	-2.750m	EPS
4	559,276.547	7,579,598.144	48.997	0.000m	Crown
5	559,278.284	7,579,596.013	48.915	2.750m	ETW
6	559,279.292	7,579,594.776	48.117	4.346m	Ditch_Out
7	559,279.347	7,579,594.709	48.117	4.432m	Daylight

CHAINAGE 100+680.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,281.400	7,579,608.018	48.419	-4.588m	Daylight
2	559,281.553	7,579,607.830	48.419	-4.346m	Ditch_Out
3	559,282.561	7,579,606.593	49.217	-2.750m	EPS
4	559,284.298	7,579,604.462	49.299	0.000m	Crown
5	559,286.036	7,579,602.330	49.217	2.750m	ETW
6	559,287.044	7,579,601.093	48.419	4.346m	Ditch_Out
7	559,287.135	7,579,600.981	48.419	4.490m	Daylight

CHAINAGE 100+690.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,289.095	7,579,614.405	48.721	-4.677m	Daylight
2	559,289.305	7,579,614.148	48.721	-4.346m	Ditch_Out
3	559,290.313	7,579,612.911	49.519	-2.750m	EPS
4	559,292.050	7,579,610.779	49.601	0.000m	Crown
5	559,293.787	7,579,608.647	49.519	2.750m	ETW
6	559,294.796	7,579,607.410	48.721	4.346m	Ditch_Out
7	559,294.889	7,579,607.296	48.721	4.493m	Daylight

CHAINAGE 100+700.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,296.850	7,579,620.718	49.023	-4.672m	Daylight
2	559,297.057	7,579,620.465	49.023	-4.346m	Ditch_Out
3	559,298.065	7,579,619.228	49.820	-2.750m	EPS
4	559,299.802	7,579,617.097	49.903	0.000m	Crown
5	559,301.539	7,579,614.965	49.820	2.750m	ETW
6	559,302.547	7,579,613.728	49.023	4.346m	Ditch_Out
7	559,302.630	7,579,613.626	49.023	4.477m	Daylight

CHAINAGE 100+710.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,304.704	7,579,626.911	49.325	-4.511m	Daylight
2	559,304.808	7,579,626.783	49.325	-4.346m	Ditch_Out

3	559,305.816	7,579,625.546	50.122	-2.750m	EPS
4	559,307.554	7,579,623.414	50.205	0.000m	Crown
5	559,309.291	7,579,621.282	50.122	2.750m	ETW
6	559,310.299	7,579,620.045	49.325	4.346m	Ditch_Out
7	559,310.324	7,579,620.014	49.325	4.385m	Daylight
CHAINAGE 100+720.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,312.500	7,579,633.174	49.626	-4.441m	Daylight
2	559,312.560	7,579,633.100	49.626	-4.346m	Ditch_Out
3	559,313.568	7,579,631.863	50.424	-2.750m	EPS
4	559,315.306	7,579,629.731	50.506	0.000m	Crown
5	559,317.043	7,579,627.600	50.424	2.750m	ETW
6	559,318.051	7,579,626.363	49.626	4.346m	Hinge
7	559,318.889	7,579,625.335	49.096	5.672m	Daylight
CHAINAGE 100+730.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,320.171	7,579,639.591	49.924	-4.569m	Daylight
2	559,320.312	7,579,639.418	49.924	-4.346m	Ditch_Out
3	559,321.320	7,579,638.181	50.722	-2.750m	EPS
4	559,323.057	7,579,636.049	50.805	0.000m	Crown
5	559,324.795	7,579,633.917	50.722	2.750m	ETW
6	559,325.803	7,579,632.680	49.924	4.346m	Ditch_Out
7	559,325.926	7,579,632.529	49.924	4.541m	Daylight
CHAINAGE 100+740.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,327.850	7,579,645.997	50.219	-4.683m	Daylight
2	559,328.064	7,579,645.735	50.219	-4.346m	Ditch_Out
3	559,329.072	7,579,644.498	51.017	-2.750m	EPS
4	559,330.809	7,579,642.366	51.099	0.000m	Crown
5	559,332.546	7,579,640.235	51.017	2.750m	ETW
6	559,333.554	7,579,638.998	50.219	4.346m	Ditch_Out
7	559,333.811	7,579,638.683	50.219	4.752m	Daylight
CHAINAGE 100+750.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,335.542	7,579,652.388	50.510	-4.778m	Daylight
2	559,335.815	7,579,652.052	50.510	-4.346m	Ditch_Out
3	559,336.824	7,579,650.815	51.307	-2.750m	EPS
4	559,338.561	7,579,648.684	51.390	0.000m	Crown
5	559,340.298	7,579,646.552	51.307	2.750m	ETW
6	559,341.306	7,579,645.315	50.510	4.346m	Ditch_Out
7	559,341.619	7,579,644.932	50.510	4.840m	Daylight
CHAINAGE 100+760.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,343.307	7,579,658.689	50.797	-4.758m	Daylight
2	559,343.567	7,579,658.370	50.797	-4.346m	Ditch_Out
3	559,344.575	7,579,657.133	51.594	-2.750m	EPS
4	559,346.313	7,579,655.001	51.677	0.000m	Crown
5	559,348.050	7,579,652.869	51.594	2.750m	ETW
6	559,349.058	7,579,651.632	50.797	4.346m	Ditch_Out
7	559,349.379	7,579,651.239	50.797	4.853m	Daylight
CHAINAGE 100+770.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,351.139	7,579,664.908	51.080	-4.631m	Daylight
2	559,351.319	7,579,664.687	51.080	-4.346m	Ditch_Out
3	559,352.327	7,579,663.450	51.878	-2.750m	EPS
4	559,354.064	7,579,661.319	51.961	0.000m	Crown
5	559,355.802	7,579,659.187	51.878	2.750m	ETW
6	559,356.810	7,579,657.950	51.080	4.346m	Ditch_Out
7	559,356.873	7,579,657.873	51.080	4.445m	Daylight
CHAINAGE 100+780.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,358.899	7,579,671.215	51.364	-4.617m	Daylight
2	559,359.071	7,579,671.005	51.364	-4.346m	Ditch_Out
3	559,360.079	7,579,669.768	52.162	-2.750m	ETW
4	559,361.816	7,579,667.636	52.244	0.000m	Crown
5	559,363.553	7,579,665.504	52.162	2.750m	ETW
CHAINAGE 100+790.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,366.578	7,579,677.622	51.647	-4.732m	Daylight
2	559,366.823	7,579,677.322	51.647	-4.346m	Ditch_Out
3	559,367.831	7,579,676.085	52.445	-2.750m	ETW
4	559,369.568	7,579,673.953	52.527	0.000m	Crown
5	559,371.305	7,579,671.822	52.445	2.750m	ETW
CHAINAGE 100+800.000					

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,374.251	7,579,684.036	51.930	-4.857m	Daylight
2	559,374.574	7,579,683.640	51.930	-4.346m	Ditch_Out
3	559,375.582	7,579,682.403	52.728	-2.750m	ETW
4	559,377.320	7,579,680.271	52.811	0.000m	Crown
5	559,379.057	7,579,678.139	52.728	2.750m	ETW
CHAINAGE 100+810.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,382.009	7,579,690.346	52.214	-4.847m	Daylight
2	559,382.326	7,579,689.957	52.214	-4.346m	Ditch_Out
3	559,383.334	7,579,688.720	53.011	-2.750m	ETW
4	559,385.071	7,579,686.588	53.094	0.000m	Crown
5	559,386.809	7,579,684.457	53.011	2.750m	ETW
CHAINAGE 100+820.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,389.829	7,579,696.579	52.497	-4.739m	Daylight
2	559,390.078	7,579,696.274	52.497	-4.346m	Ditch_Out
3	559,391.086	7,579,695.038	53.295	-2.750m	ETW
4	559,392.823	7,579,692.906	53.377	0.000m	Crown
5	559,394.561	7,579,690.774	53.304	2.750m	ETW
CHAINAGE 100+830.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,397.514	7,579,702.980	52.780	-4.846m	Daylight
2	559,397.830	7,579,702.592	52.780	-4.346m	Ditch_Out
3	559,398.838	7,579,701.355	53.578	-2.750m	EPS
4	559,400.575	7,579,699.223	53.661	0.000m	Crown
5	559,402.312	7,579,697.091	53.642	2.750m	ETW
6	559,403.273	7,579,695.913	52.882	4.270m	Ditch_Out
7	559,403.589	7,579,695.525	52.882	4.770m	Daylight

Corridor Section Points Report

Client:
ISSF Road Rehabilitation Project
PSPC / NRCAN

Date: 7/22/2022 9:14:58 AM

Corridor Name: L200-A1 - CORR
Description:
Base Alignment Name: L200-A1
Station Range: Start: 200+040.000, End: 201+200.000

Prepared by:
SM
Tetra Tech
TRN.VHWY - Vancouver

Grade Sheet Legend

Listing Legend

X = Northing

Y = Easting

Z = Elevation

Offset = Distance from Centerline

String Cut = Point Description

Point Description Legend

Daylight = Daylight Cut

Ditch Out = Subgrade Shoulder (Daylight Situation)

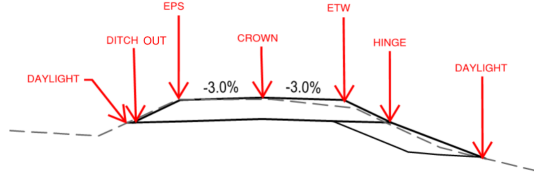
EPS = Finished Grade Shoulder

Crown = Centerline Finished Grade

ETW = Finished Grade Shoulder

Hinge = Subgrade Shoulder (Fill Situation)

Daylight = Toe of Slope



CHAINAGE 200+040.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,420.657	7,579,668.218	52.911	-4.852m	Daylight
2	559,420.434	7,579,667.778	52.911	-4.359m	Ditch_Out
3	559,419.709	7,579,666.342	53.716	-2.750m	EPS
4	559,418.468	7,579,663.887	53.809	0.000m	Crown
5	559,417.228	7,579,661.433	53.903	2.750m	ETW
6	559,416.595	7,579,660.179	53.200	4.154m	Ditch_Out
7	559,416.550	7,579,660.090	53.200	4.254m	Daylight

CHAINAGE 200+050.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,429.249	7,579,664.020	53.181	-4.533m	Daylight
2	559,429.186	7,579,663.859	53.181	-4.359m	Ditch_Out
3	559,428.597	7,579,662.361	53.986	-2.750m	EPS
4	559,427.592	7,579,659.801	54.080	0.000m	Crown
5	559,426.586	7,579,657.241	54.173	2.750m	ETW
6	559,426.072	7,579,655.934	53.471	4.154m	Ditch_Out
7	559,425.772	7,579,655.171	53.471	4.975m	Daylight

CHAINAGE 200+060.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,438.407	7,579,661.265	53.523	-4.872m	Daylight
2	559,438.265	7,579,660.773	53.523	-4.359m	Ditch_Out
3	559,437.819	7,579,659.226	54.327	-2.750m	EPS
4	559,437.056	7,579,656.584	54.421	0.000m	Crown
5	559,436.294	7,579,653.942	54.514	2.750m	ETW
6	559,435.905	7,579,652.593	53.812	4.154m	Ditch_Out
7	559,435.685	7,579,651.831	53.812	4.947m	Daylight

CHAINAGE 200+070.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,447.656	7,579,658.883	53.939	-4.700m	Daylight
2	559,447.592	7,579,658.548	53.939	-4.359m	Ditch_Out
3	559,447.292	7,579,656.967	54.744	-2.750m	EPS
4	559,446.780	7,579,654.265	54.837	0.000m	Crown
5	559,446.267	7,579,651.563	54.931	2.750m	ETW
6	559,446.006	7,579,650.183	54.229	4.154m	Ditch_Out
7	559,445.831	7,579,649.264	54.229	5.090m	Daylight

CHAINAGE 200+080.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,457.131	7,579,657.672	54.385	-4.830m	Daylight
2	559,457.086	7,579,657.203	54.385	-4.359m	Ditch_Out
3	559,456.935	7,579,655.601	55.189	-2.750m	EPS
4	559,456.677	7,579,652.863	55.283	0.000m	Crown
5	559,456.419	7,579,650.125	55.376	2.750m	ETW
6	559,456.287	7,579,648.727	54.674	4.154m	Ditch_Out
7	559,456.210	7,579,647.906	54.674	4.979m	Daylight

CHAINAGE 200+090.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,466.665	7,579,657.300	54.830	-4.909m	Daylight
2	559,466.665	7,579,656.750	54.830	-4.359m	Ditch_Out
3	559,466.664	7,579,655.141	55.635	-2.750m	EPS
4	559,466.663	7,579,652.391	55.728	0.000m	Crown
5	559,466.661	7,579,649.641	55.822	2.750m	ETW
6	559,466.660	7,579,648.236	55.119	4.154m	Ditch_Out
7	559,466.660	7,579,647.260	55.120	5.131m	Daylight

CHAINAGE 200+100.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,476.149	7,579,658.212	55.279	-5.383m	Daylight
2	559,476.244	7,579,657.193	55.279	-4.359m	Ditch_Out
3	559,476.393	7,579,655.590	56.084	-2.750m	EPS
4	559,476.648	7,579,652.852	56.177	0.000m	Crown
5	559,476.903	7,579,650.114	56.271	2.750m	ETW
6	559,477.034	7,579,648.716	55.569	4.154m	Ditch_Out
7	559,477.061	7,579,648.420	55.569	4.452m	Daylight

CHAINAGE 200+110.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,485.570	7,579,659.428	55.797	-5.275m	Daylight
2	559,485.739	7,579,658.528	55.797	-4.359m	Ditch_Out
3	559,486.038	7,579,656.946	56.602	-2.750m	EPS
4	559,486.547	7,579,654.244	56.696	0.000m	Crown
5	559,487.057	7,579,651.542	56.789	2.750m	ETW
6	559,487.317	7,579,650.161	56.087	4.154m	Ditch_Out
7	559,487.349	7,579,649.992	56.087	4.327m	Daylight
CHAINAGE 200+120.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,494.843	7,579,661.530	56.408	-5.179m	Daylight
2	559,495.069	7,579,660.743	56.408	-4.359m	Ditch_Out
3	559,495.514	7,579,659.196	57.212	-2.750m	EPS
4	559,496.273	7,579,656.553	57.306	0.000m	Crown
5	559,497.033	7,579,653.910	57.399	2.750m	ETW
6	559,497.421	7,579,652.560	56.697	4.154m	Hinge
7	559,497.752	7,579,651.409	56.218	5.353m	Daylight
CHAINAGE 200+130.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,504.016	7,579,664.165	57.050	-4.730m	Daylight
2	559,504.153	7,579,663.815	57.050	-4.355m	Ditch_Out
3	559,504.738	7,579,662.321	57.852	-2.750m	EPS
4	559,505.741	7,579,659.760	57.942	0.000m	Crown
5	559,506.744	7,579,657.199	58.005	2.750m	ETW
6	559,507.267	7,579,655.864	57.288	4.185m	Ditch_Out
7	559,507.368	7,579,655.607	57.288	4.460m	Daylight
CHAINAGE 200+140.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,513.425	7,579,667.556	57.571	-4.452m	Daylight
2	559,513.464	7,579,667.458	57.571	-4.347m	Ditch_Out
3	559,514.047	7,579,665.971	58.370	-2.750m	EPS
4	559,515.051	7,579,663.411	58.453	0.000m	Crown
5	559,516.055	7,579,660.851	58.461	2.750m	ETW
6	559,516.600	7,579,659.462	57.715	4.242m	Ditch_Out
7	559,516.788	7,579,658.982	57.715	4.758m	Daylight
CHAINAGE 200+150.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,522.766	7,579,671.127	57.956	-4.366m	Daylight
2	559,522.774	7,579,671.108	57.956	-4.346m	Ditch_Out
3	559,523.356	7,579,669.623	58.754	-2.750m	EPS
4	559,524.360	7,579,667.063	58.836	0.000m	Crown
5	559,525.365	7,579,664.502	58.789	2.750m	ETW
6	559,525.932	7,579,663.056	58.012	4.304m	Ditch_Out
7	559,526.200	7,579,662.371	58.012	5.039m	Daylight
CHAINAGE 200+160.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,531.624	7,579,675.930	57.803	-5.604m	Daylight
2	559,532.083	7,579,674.760	58.306	-4.346m	Hinge
3	559,532.666	7,579,673.274	59.104	-2.750m	ETW
4	559,533.670	7,579,670.714	59.186	0.000m	Crown
5	559,534.674	7,579,668.154	59.104	2.750m	ETW
6	559,535.257	7,579,666.668	58.306	4.346m	Ditch_Out
7	559,535.562	7,579,665.890	58.306	5.181m	Daylight
CHAINAGE 200+170.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,540.979	7,579,679.467	58.212	-5.480m	Daylight
2	559,541.393	7,579,678.411	58.665	-4.346m	Hinge
3	559,541.976	7,579,676.925	59.463	-2.750m	ETW
4	559,542.980	7,579,674.365	59.546	0.000m	Crown
5	559,543.984	7,579,671.805	59.463	2.750m	ETW
6	559,544.566	7,579,670.319	58.665	4.346m	Ditch_Out
7	559,544.939	7,579,669.369	58.665	5.366m	Daylight
CHAINAGE 200+180.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,550.653	7,579,682.189	59.035	-4.482m	Daylight
2	559,550.702	7,579,682.062	59.035	-4.346m	Ditch_Out
3	559,551.285	7,579,680.576	59.833	-2.750m	EPS
4	559,552.289	7,579,678.016	59.915	0.000m	Crown
5	559,553.293	7,579,675.456	59.833	2.750m	ETW
6	559,553.876	7,579,673.971	59.035	4.346m	Ditch_Out
7	559,554.250	7,579,673.018	59.035	5.369m	Daylight
CHAINAGE 200+190.000					
POINT	X	Y	Z	OFFSET	STRING CUT

1	559,559.870	7,579,686.074	59.414	-4.734m	Daylight
2	559,560.012	7,579,685.713	59.414	-4.346m	Ditch_Out
3	559,560.595	7,579,684.228	60.212	-2.750m	EPS
4	559,561.599	7,579,681.668	60.294	0.000m	Crown
5	559,562.603	7,579,679.107	60.212	2.750m	ETW
6	559,563.186	7,579,677.622	59.414	4.346m	Ditch_Out
7	559,563.448	7,579,676.953	59.414	5.064m	Daylight
CHAINAGE 200+200.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,569.101	7,579,689.928	59.800	-4.951m	Daylight
2	559,569.322	7,579,689.364	59.800	-4.346m	Ditch_Out
3	559,569.904	7,579,687.879	60.598	-2.750m	EPS
4	559,570.908	7,579,685.319	60.681	0.000m	Crown
5	559,571.912	7,579,682.759	60.598	2.750m	ETW
6	559,572.495	7,579,681.273	59.800	4.346m	Ditch_Out
7	559,572.643	7,579,680.895	59.800	4.752m	Daylight
CHAINAGE 200+210.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,578.371	7,579,693.678	60.200	-5.057m	Daylight
2	559,578.635	7,579,693.006	60.200	-4.335m	Ditch_Out
3	559,579.214	7,579,691.530	60.993	-2.750m	EPS
4	559,580.218	7,579,688.970	61.067	0.000m	Crown
5	559,581.222	7,579,686.410	60.984	2.750m	ETW
6	559,581.805	7,579,684.924	60.187	4.346m	Ditch_Out
7	559,581.960	7,579,684.528	60.187	4.772m	Daylight
CHAINAGE 200+220.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,587.713	7,579,697.247	60.674	-4.969m	Daylight
2	559,587.968	7,579,696.598	60.674	-4.271m	Ditch_Out
3	559,588.523	7,579,695.181	61.434	-2.750m	EPS
4	559,589.528	7,579,692.621	61.453	0.000m	Crown
5	559,590.532	7,579,690.061	61.371	2.750m	ETW
6	559,591.114	7,579,688.576	60.573	4.346m	Ditch_Out
7	559,591.399	7,579,687.851	60.573	5.124m	Daylight
CHAINAGE 200+230.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,597.066	7,579,700.789	61.145	-4.852m	Daylight
2	559,597.299	7,579,700.194	61.145	-4.212m	Ditch_Out
3	559,597.833	7,579,698.833	61.876	-2.750m	EPS
4	559,598.837	7,579,696.273	61.840	0.000m	Crown
5	559,599.841	7,579,693.712	61.757	2.750m	ETW
6	559,600.424	7,579,692.227	60.960	4.346m	Ditch_Out
7	559,600.801	7,579,691.264	60.960	5.380m	Daylight
CHAINAGE 200+240.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,606.865	7,579,703.770	61.601	-4.244m	Daylight
2	559,606.890	7,579,703.695	61.601	-4.165m	Ditch_Out
3	559,607.339	7,579,702.354	62.309	-2.750m	EPS
4	559,608.213	7,579,699.746	62.226	0.000m	Crown
5	559,609.087	7,579,697.139	62.144	2.750m	ETW
6	559,609.594	7,579,695.625	61.346	4.346m	Ditch_Out
7	559,610.000	7,579,694.413	61.346	5.624m	Daylight
CHAINAGE 200+250.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,616.669	7,579,706.899	61.988	-4.441m	Daylight
2	559,616.739	7,579,706.632	61.988	-4.165m	Ditch_Out
3	559,617.098	7,579,705.263	62.695	-2.750m	EPS
4	559,617.794	7,579,702.603	62.613	0.000m	Crown
5	559,618.491	7,579,699.942	62.530	2.750m	ETW
6	559,618.896	7,579,698.399	61.732	4.346m	Ditch_Out
7	559,619.179	7,579,697.317	61.733	5.464m	Daylight
CHAINAGE 200+260.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,626.696	7,579,709.252	62.373	-4.523m	Daylight
2	559,626.763	7,579,708.901	62.373	-4.165m	Ditch_Out
3	559,627.029	7,579,707.511	63.080	-2.750m	EPS
4	559,627.546	7,579,704.810	62.998	0.000m	Crown
5	559,628.063	7,579,702.109	62.915	2.750m	ETW
6	559,628.363	7,579,700.542	62.117	4.346m	Ditch_Out
7	559,628.570	7,579,699.456	62.118	5.451m	Daylight
CHAINAGE 200+270.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,636.810	7,579,711.361	62.744	-5.039m	Daylight
2	559,636.916	7,579,710.493	62.744	-4.165m	Ditch_Out
3	559,637.089	7,579,709.088	63.452	-2.750m	EPS

4	559,637.423	7,579,706.359	63.369	0.000m	Crown
5	559,637.758	7,579,703.629	63.287	2.750m	ETW
6	559,637.952	7,579,702.045	62.489	4.346m	Ditch_Out
7	559,638.017	7,579,701.514	62.489	4.881m	Daylight
CHAINAGE 200+280.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,647.116	7,579,712.083	63.099	-4.849m	Daylight
2	559,647.154	7,579,711.400	63.099	-4.165m	Ditch_Out
3	559,647.231	7,579,709.987	63.806	-2.750m	EPS
4	559,647.382	7,579,707.242	63.724	0.000m	Crown
5	559,647.533	7,579,704.496	63.641	2.750m	ETW
6	559,647.620	7,579,702.902	62.843	4.346m	Ditch_Out
7	559,647.637	7,579,702.601	62.843	4.647m	Daylight
CHAINAGE 200+290.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,657.440	7,579,712.541	63.436	-5.087m	Daylight
2	559,657.429	7,579,711.619	63.436	-4.165m	Ditch_Out
3	559,657.412	7,579,710.204	64.144	-2.750m	EPS
4	559,657.378	7,579,707.454	64.061	0.000m	Crown
5	559,657.344	7,579,704.705	63.979	2.750m	ETW
6	559,657.325	7,579,703.109	63.181	4.346m	Hinge
7	559,657.311	7,579,701.975	62.727	5.479m	Daylight
CHAINAGE 200+300.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,667.741	7,579,711.715	63.757	-4.733m	Daylight
2	559,667.696	7,579,711.148	63.757	-4.165m	Ditch_Out
3	559,667.584	7,579,709.738	64.465	-2.750m	EPS
4	559,667.366	7,579,706.996	64.382	0.000m	Crown
5	559,667.148	7,579,704.255	64.300	2.750m	ETW
6	559,667.021	7,579,702.664	63.502	4.346m	Ditch_Out
7	559,666.995	7,579,702.340	63.502	4.671m	Daylight
CHAINAGE 200+310.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,677.978	7,579,710.465	64.061	-4.645m	Daylight
2	559,677.908	7,579,709.990	64.061	-4.165m	Ditch_Out
3	559,677.702	7,579,708.590	64.769	-2.750m	EPS
4	559,677.300	7,579,705.870	64.686	0.000m	Crown
5	559,676.899	7,579,703.149	64.604	2.750m	ETW
6	559,676.666	7,579,701.571	63.806	4.346m	Ditch_Out
7	559,676.578	7,579,700.973	63.806	4.950m	Daylight
CHAINAGE 200+320.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,688.267	7,579,709.292	63.881	-5.334m	Daylight
2	559,688.020	7,579,708.150	64.348	-4.165m	Hinge
3	559,687.720	7,579,706.767	65.056	-2.750m	ETW
4	559,687.137	7,579,704.079	64.973	0.000m	Crown
5	559,686.554	7,579,701.392	64.891	2.750m	ETW
6	559,686.215	7,579,699.832	64.093	4.346m	Ditch_Out
7	559,686.063	7,579,699.129	64.093	5.066m	Daylight
CHAINAGE 200+330.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,698.014	7,579,705.736	64.606	-4.270m	Daylight
2	559,697.987	7,579,705.643	64.606	-4.174m	Ditch_Out
3	559,697.593	7,579,704.276	65.318	-2.750m	EPS
4	559,696.831	7,579,701.633	65.244	0.000m	Crown
5	559,696.069	7,579,698.991	65.161	2.750m	ETW
6	559,695.627	7,579,697.458	64.363	4.346m	Ditch_Out
7	559,695.539	7,579,697.153	64.363	4.663m	Daylight
CHAINAGE 200+340.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,707.875	7,579,703.326	64.777	-4.920m	Daylight
2	559,707.665	7,579,702.669	64.776	-4.230m	Ditch_Out
3	559,707.213	7,579,701.260	65.516	-2.750m	EPS
4	559,706.372	7,579,698.641	65.497	0.000m	Crown
5	559,705.532	7,579,696.023	65.415	2.750m	ETW
6	559,705.045	7,579,694.503	64.617	4.346m	Ditch_Out
7	559,705.010	7,579,694.396	64.617	4.458m	Daylight
CHAINAGE 200+350.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,717.450	7,579,700.434	64.928	-5.091m	Daylight
2	559,717.205	7,579,699.671	64.928	-4.290m	Ditch_Out
3	559,716.734	7,579,698.205	65.698	-2.750m	EPS
4	559,715.894	7,579,695.586	65.734	0.000m	Crown
5	559,715.054	7,579,692.968	65.652	2.750m	ETW
6	559,714.567	7,579,691.448	64.854	4.346m	Ditch_Out

7	559,714.549	7,579,691.395	64.854	4.402m	Daylight
CHAINAGE 200+360.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,727.004	7,579,697.480	65.074	-5.198m	Daylight
2	559,726.744	7,579,696.669	65.074	-4.346m	Ditch_Out
3	559,726.256	7,579,695.150	65.872	-2.750m	EPS
4	559,725.416	7,579,692.531	65.954	0.000m	Crown
5	559,724.576	7,579,689.913	65.872	2.750m	ETW
6	559,724.089	7,579,688.393	65.074	4.346m	Ditch_Out
7	559,724.062	7,579,688.309	65.074	4.434m	Daylight
CHAINAGE 200+370.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,736.594	7,579,694.636	65.292	-5.419m	Daylight
2	559,736.266	7,579,693.614	65.292	-4.346m	Ditch_Out
3	559,735.778	7,579,692.095	66.090	-2.750m	EPS
4	559,734.938	7,579,689.476	66.172	0.000m	Crown
5	559,734.098	7,579,686.857	66.090	2.750m	ETW
6	559,733.610	7,579,685.338	65.292	4.346m	Ditch_Out
7	559,733.591	7,579,685.278	65.292	4.408m	Daylight
CHAINAGE 200+380.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,746.114	7,579,691.576	65.536	-5.414m	Daylight
2	559,745.788	7,579,690.559	65.536	-4.346m	Ditch_Out
3	559,745.300	7,579,689.040	66.334	-2.750m	EPS
4	559,744.460	7,579,686.421	66.416	0.000m	Crown
5	559,743.620	7,579,683.802	66.334	2.750m	ETW
6	559,743.132	7,579,682.283	65.536	4.346m	Ditch_Out
7	559,743.058	7,579,682.051	65.536	4.589m	Daylight
CHAINAGE 200+390.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,755.573	7,579,688.325	65.807	-5.208m	Daylight
2	559,755.310	7,579,687.504	65.807	-4.346m	Ditch_Out
3	559,754.822	7,579,685.984	66.605	-2.750m	EPS
4	559,753.982	7,579,683.366	66.687	0.000m	Crown
5	559,753.142	7,579,680.747	66.605	2.750m	ETW
6	559,752.654	7,579,679.228	65.807	4.346m	Ditch_Out
7	559,752.592	7,579,679.035	65.807	4.549m	Daylight
CHAINAGE 200+400.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,764.998	7,579,684.969	66.105	-4.892m	Daylight
2	559,764.831	7,579,684.449	66.105	-4.346m	Ditch_Out
3	559,764.344	7,579,682.929	66.903	-2.750m	EPS
4	559,763.504	7,579,680.311	66.986	0.000m	Crown
5	559,762.664	7,579,677.692	66.903	2.750m	ETW
6	559,762.176	7,579,676.173	66.105	4.346m	Ditch_Out
7	559,762.169	7,579,676.151	66.105	4.369m	Daylight
CHAINAGE 200+410.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,774.428	7,579,681.626	66.431	-4.590m	Daylight
2	559,774.353	7,579,681.394	66.431	-4.346m	Ditch_Out
3	559,773.866	7,579,679.874	67.229	-2.750m	EPS
4	559,773.026	7,579,677.256	67.312	0.000m	Crown
5	559,772.186	7,579,674.637	67.229	2.750m	ETW
6	559,771.698	7,579,673.118	66.431	4.346m	Ditch_Out
7	559,771.574	7,579,672.732	66.431	4.751m	Daylight
CHAINAGE 200+420.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,783.981	7,579,678.667	66.784	-4.690m	Daylight
2	559,783.875	7,579,678.339	66.784	-4.346m	Ditch_Out
3	559,783.388	7,579,676.819	67.582	-2.750m	EPS
4	559,782.548	7,579,674.201	67.665	0.000m	Crown
5	559,781.708	7,579,671.582	67.582	2.750m	ETW
6	559,781.220	7,579,670.063	66.784	4.346m	Ditch_Out
7	559,780.985	7,579,669.330	66.784	5.116m	Daylight
CHAINAGE 200+430.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,793.529	7,579,675.696	67.148	-4.778m	Daylight
2	559,793.397	7,579,675.284	67.148	-4.346m	Ditch_Out
3	559,792.910	7,579,673.764	67.946	-2.750m	EPS
4	559,792.070	7,579,671.146	68.028	0.000m	Crown
5	559,791.229	7,579,668.527	67.946	2.750m	ETW
6	559,790.742	7,579,667.009	67.149	4.345m	Ditch_Out
7	559,790.468	7,579,666.155	67.149	5.241m	Daylight
CHAINAGE 200+440.000					

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,803.078	7,579,672.724	67.511	-4.866m	Daylight
2	559,802.919	7,579,672.229	67.511	-4.346m	Ditch_Out
3	559,802.432	7,579,670.709	68.309	-2.750m	EPS
4	559,801.591	7,579,668.091	68.392	0.000m	Crown
5	559,800.751	7,579,665.472	68.365	2.750m	ETW
6	559,800.284	7,579,664.016	67.600	4.280m	Ditch_Out
7	559,800.132	7,579,663.542	67.600	4.777m	Daylight

CHAINAGE 200+450.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,812.643	7,579,669.805	67.875	-5.008m	Daylight
2	559,812.441	7,579,669.174	67.875	-4.346m	Ditch_Out
3	559,811.954	7,579,667.654	68.673	-2.750m	EPS
4	559,811.113	7,579,665.036	68.755	0.000m	Crown
5	559,810.273	7,579,662.417	68.783	2.750m	ETW
6	559,809.824	7,579,661.018	68.048	4.220m	Ditch_Out
7	559,809.803	7,579,660.951	68.048	4.289m	Daylight

CHAINAGE 200+460.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,822.092	7,579,667.290	68.246	-5.386m	Daylight
2	559,821.818	7,579,666.288	68.246	-4.347m	Ditch_Out
3	559,821.396	7,579,664.748	69.044	-2.750m	EPS
4	559,820.670	7,579,662.095	69.127	0.000m	Crown
5	559,819.944	7,579,659.443	69.211	2.750m	ETW
6	559,819.571	7,579,658.079	68.503	4.164m	Hinge
7	559,818.833	7,579,655.385	67.386	6.957m	Daylight

CHAINAGE 200+470.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,831.342	7,579,664.712	68.628	-4.967m	Daylight
2	559,831.227	7,579,664.109	68.627	-4.353m	Ditch_Out
3	559,830.926	7,579,662.535	69.429	-2.750m	EPS
4	559,830.409	7,579,659.834	69.517	0.000m	Crown
5	559,829.892	7,579,657.133	69.605	2.750m	ETW
6	559,829.627	7,579,655.748	68.900	4.160m	Ditch_Out
7	559,829.606	7,579,655.639	68.900	4.272m	Daylight

CHAINAGE 200+480.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,840.829	7,579,663.145	69.034	-4.835m	Daylight
2	559,840.776	7,579,662.666	69.034	-4.353m	Ditch_Out
3	559,840.598	7,579,661.073	69.835	-2.750m	EPS
4	559,840.294	7,579,658.340	69.923	0.000m	Crown
5	559,839.989	7,579,655.607	70.011	2.750m	ETW
6	559,839.833	7,579,654.206	69.306	4.160m	Ditch_Out
7	559,839.810	7,579,653.997	69.306	4.370m	Daylight

CHAINAGE 200+490.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,850.443	7,579,663.036	69.032	-5.417m	Daylight
2	559,850.408	7,579,661.972	69.458	-4.353m	Hinge
3	559,850.356	7,579,660.370	70.259	-2.750m	ETW
4	559,850.265	7,579,657.622	70.347	0.000m	Crown
5	559,850.175	7,579,654.873	70.435	2.750m	ETW
6	559,850.129	7,579,653.464	69.730	4.160m	Ditch_Out
7	559,850.107	7,579,652.797	69.730	4.827m	Daylight

CHAINAGE 200+500.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,860.044	7,579,662.519	69.698	-4.840m	Daylight
2	559,860.066	7,579,662.032	69.893	-4.353m	Hinge
3	559,860.138	7,579,660.431	70.694	-2.750m	ETW
4	559,860.263	7,579,657.684	70.782	0.000m	Crown
5	559,860.387	7,579,654.937	70.870	2.750m	ETW
6	559,860.451	7,579,653.528	70.165	4.160m	Ditch_Out
7	559,860.503	7,579,652.374	70.165	5.315m	Daylight

CHAINAGE 200+510.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,869.585	7,579,663.686	69.997	-5.199m	Daylight
2	559,869.689	7,579,662.846	70.336	-4.353m	Hinge
3	559,869.886	7,579,661.255	71.137	-2.750m	ETW
4	559,870.225	7,579,658.526	71.225	0.000m	Crown
5	559,870.563	7,579,655.797	71.313	2.750m	ETW
6	559,870.737	7,579,654.398	70.608	4.160m	Ditch_Out
7	559,870.861	7,579,653.398	70.608	5.167m	Daylight

CHAINAGE 200+520.000

POINT	X	Y	Z	OFFSET	STRING CUT
1	559,879.108	7,579,664.950	70.809	-4.906m	Daylight
2	559,879.219	7,579,664.408	70.809	-4.353m	Ditch_Out

3	559,879.540	7,579,662.838	71.611	-2.750m	EPS
4	559,880.090	7,579,660.143	71.699	0.000m	Crown
5	559,880.641	7,579,657.449	71.787	2.750m	ETW
6	559,880.923	7,579,656.068	71.082	4.160m	Ditch_Out
7	559,881.043	7,579,655.480	71.082	4.760m	Daylight
CHAINAGE 200+530.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,888.412	7,579,667.360	71.314	-5.030m	Daylight
2	559,888.598	7,579,666.709	71.314	-4.353m	Ditch_Out
3	559,889.041	7,579,665.169	72.115	-2.750m	EPS
4	559,889.800	7,579,662.526	72.203	0.000m	Crown
5	559,890.559	7,579,659.883	72.291	2.750m	ETW
6	559,890.948	7,579,658.528	71.587	4.160m	Ditch_Out
7	559,891.088	7,579,658.040	71.587	4.667m	Daylight
CHAINAGE 200+540.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,897.450	7,579,670.590	71.851	-5.265m	Daylight
2	559,897.769	7,579,669.735	71.851	-4.353m	Ditch_Out
3	559,898.331	7,579,668.234	72.652	-2.750m	EPS
4	559,899.294	7,579,665.659	72.740	0.000m	Crown
5	559,900.257	7,579,663.083	72.828	2.750m	ETW
6	559,900.751	7,579,661.762	72.123	4.160m	Ditch_Out
7	559,900.777	7,579,661.692	72.123	4.235m	Daylight
CHAINAGE 200+550.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,906.411	7,579,674.039	72.419	-4.982m	Daylight
2	559,906.676	7,579,673.468	72.419	-4.353m	Ditch_Out
3	559,907.353	7,579,672.016	73.220	-2.750m	EPS
4	559,908.514	7,579,669.523	73.308	0.000m	Crown
5	559,909.675	7,579,667.030	73.396	2.750m	ETW
6	559,910.271	7,579,665.752	72.691	4.160m	Ditch_Out
7	559,910.289	7,579,665.713	72.691	4.202m	Daylight
CHAINAGE 200+560.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,914.892	7,579,678.545	73.019	-5.111m	Daylight
2	559,915.265	7,579,677.885	73.019	-4.353m	Ditch_Out
3	559,916.053	7,579,676.489	73.820	-2.750m	EPS
4	559,917.405	7,579,674.095	73.908	0.000m	Crown
5	559,918.757	7,579,671.700	73.996	2.750m	ETW
6	559,919.450	7,579,670.473	73.291	4.160m	Hinge
7	559,920.069	7,579,669.377	72.788	5.418m	Daylight
CHAINAGE 200+570.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,922.996	7,579,683.682	73.651	-5.224m	Daylight
2	559,923.482	7,579,682.958	73.651	-4.353m	Ditch_Out
3	559,924.377	7,579,681.628	74.452	-2.750m	EPS
4	559,925.912	7,579,679.347	74.540	0.000m	Crown
5	559,927.447	7,579,677.065	74.628	2.750m	ETW
6	559,928.234	7,579,675.895	73.923	4.160m	Hinge
7	559,929.091	7,579,674.621	73.309	5.695m	Daylight
CHAINAGE 200+580.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,930.939	7,579,689.087	74.323	-4.900m	Daylight
2	559,931.283	7,579,688.652	74.323	-4.346m	Ditch_Out
3	559,932.275	7,579,687.402	75.121	-2.750m	EPS
4	559,933.983	7,579,685.247	75.203	0.000m	Crown
5	559,935.691	7,579,683.092	75.263	2.750m	ETW
6	559,936.584	7,579,681.965	74.544	4.188m	Ditch_Out
7	559,936.843	7,579,681.639	74.544	4.604m	Daylight
CHAINAGE 200+590.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,938.906	7,579,695.063	75.017	-4.544m	Daylight
2	559,939.030	7,579,694.909	75.017	-4.346m	Ditch_Out
3	559,940.033	7,579,693.668	75.815	-2.750m	EPS
4	559,941.763	7,579,691.530	75.897	0.000m	Crown
5	559,943.492	7,579,689.391	75.902	2.750m	ETW
6	559,944.432	7,579,688.229	75.155	4.245m	Ditch_Out
7	559,945.005	7,579,687.520	75.155	5.157m	Daylight
CHAINAGE 200+600.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,946.739	7,579,701.279	75.722	-4.452m	Daylight
2	559,946.806	7,579,701.196	75.722	-4.346m	Ditch_Out
3	559,947.809	7,579,699.956	76.520	-2.750m	EPS
4	559,949.538	7,579,697.817	76.602	0.000m	Crown
5	559,951.268	7,579,695.679	76.552	2.750m	ETW

6	559,952.247	7,579,694.468	75.773	4.307m	Ditch_Out
7	559,952.965	7,579,693.579	75.774	5.450m	Daylight
CHAINAGE 200+610.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,954.536	7,579,707.541	76.427	-4.419m	Daylight
2	559,954.582	7,579,707.484	76.427	-4.346m	Ditch_Out
3	559,955.585	7,579,706.243	77.225	-2.750m	EPS
4	559,957.314	7,579,704.105	77.307	0.000m	Crown
5	559,959.044	7,579,701.966	77.225	2.750m	ETW
6	559,960.047	7,579,700.726	76.427	4.346m	Ditch_Out
7	559,960.730	7,579,699.881	76.427	5.432m	Daylight
CHAINAGE 200+620.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,962.337	7,579,713.798	77.132	-4.380m	Daylight
2	559,962.358	7,579,713.772	77.132	-4.346m	Ditch_Out
3	559,963.361	7,579,712.531	77.930	-2.750m	EPS
4	559,965.090	7,579,710.393	78.012	0.000m	Crown
5	559,966.819	7,579,708.254	77.930	2.750m	ETW
6	559,967.823	7,579,707.013	77.132	4.346m	Ditch_Out
7	559,968.562	7,579,706.099	77.132	5.521m	Daylight
CHAINAGE 200+630.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,970.079	7,579,720.127	77.838	-4.433m	Daylight
2	559,970.134	7,579,720.059	77.838	-4.346m	Ditch_Out
3	559,971.137	7,579,718.819	78.636	-2.750m	EPS
4	559,972.866	7,579,716.680	78.719	0.000m	Crown
5	559,974.595	7,579,714.542	78.654	2.750m	ETW
6	559,975.585	7,579,713.318	77.868	4.324m	Ditch_Out
7	559,976.431	7,579,712.271	77.868	5.670m	Daylight
CHAINAGE 200+640.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,977.870	7,579,726.396	78.550	-4.409m	Daylight
2	559,977.910	7,579,726.347	78.550	-4.346m	Ditch_Out
3	559,978.913	7,579,725.106	79.348	-2.750m	EPS
4	559,980.642	7,579,722.968	79.430	0.000m	Crown
5	559,982.371	7,579,720.829	79.421	2.750m	ETW
6	559,983.321	7,579,719.655	78.666	4.260m	Ditch_Out
7	559,983.875	7,579,718.970	78.666	5.142m	Daylight
CHAINAGE 200+650.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,985.571	7,579,732.762	79.267	-4.517m	Daylight
2	559,985.678	7,579,732.630	79.267	-4.346m	Ditch_Out
3	559,986.684	7,579,731.391	80.065	-2.750m	EPS
4	559,988.418	7,579,729.256	80.147	0.000m	Crown
5	559,990.151	7,579,727.121	80.200	2.750m	ETW
6	559,991.062	7,579,726.000	79.478	4.195m	Ditch_Out
7	559,991.284	7,579,725.727	79.478	4.546m	Daylight
CHAINAGE 200+660.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	559,992.882	7,579,739.316	79.989	-4.801m	Daylight
2	559,993.183	7,579,738.974	79.989	-4.346m	Ditch_Out
3	559,994.237	7,579,737.776	80.787	-2.750m	EPS
4	559,996.054	7,579,735.712	80.870	0.000m	Crown
5	559,997.871	7,579,733.648	80.952	2.750m	ETW
6	559,998.805	7,579,732.585	80.245	4.165m	Ditch_Out
7	559,998.870	7,579,732.512	80.245	4.263m	Daylight
CHAINAGE 200+670.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,000.073	7,579,745.985	80.715	-4.862m	Daylight
2	560,000.429	7,579,745.612	80.715	-4.346m	Ditch_Out
3	560,001.530	7,579,744.457	81.513	-2.750m	EPS
4	560,003.427	7,579,742.466	81.596	0.000m	Crown
5	560,005.325	7,579,740.475	81.678	2.750m	ETW
6	560,006.301	7,579,739.451	80.971	4.165m	Ditch_Out
7	560,006.337	7,579,739.413	80.971	4.217m	Daylight
CHAINAGE 200+680.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,007.274	7,579,752.660	81.432	-4.531m	Daylight
2	560,007.407	7,579,752.531	81.431	-4.346m	Ditch_Out
3	560,008.553	7,579,751.421	82.229	-2.750m	EPS
4	560,010.527	7,579,749.507	82.312	0.000m	Crown
5	560,012.502	7,579,747.593	82.394	2.750m	ETW
6	560,013.518	7,579,746.608	81.687	4.165m	Ditch_Out
7	560,013.765	7,579,746.369	81.687	4.509m	Daylight

CHAINAGE 200+690.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,013.932	7,579,759.877	82.100	-4.577m	Daylight
2	560,014.104	7,579,759.722	82.100	-4.346m	Ditch_Out
3	560,015.293	7,579,758.658	82.898	-2.750m	EPS
4	560,017.342	7,579,756.824	82.980	0.000m	Crown
5	560,019.392	7,579,754.990	83.063	2.750m	ETW
6	560,020.446	7,579,754.047	82.355	4.165m	Ditch_Out
7	560,020.801	7,579,753.729	82.355	4.642m	Daylight

CHAINAGE 200+700.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,020.337	7,579,767.317	82.717	-4.572m	Daylight
2	560,020.511	7,579,767.174	82.717	-4.346m	Ditch_Out
3	560,021.742	7,579,766.157	83.515	-2.750m	EPS
4	560,023.862	7,579,764.406	83.597	0.000m	Crown
5	560,025.982	7,579,762.655	83.680	2.750m	ETW
6	560,027.073	7,579,761.754	82.972	4.165m	Ditch_Out
7	560,027.516	7,579,761.388	82.972	4.739m	Daylight

CHAINAGE 200+710.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,026.314	7,579,775.104	83.290	-4.727m	Daylight
2	560,026.617	7,579,774.873	83.290	-4.346m	Ditch_Out
3	560,027.887	7,579,773.906	84.088	-2.750m	EPS
4	560,030.075	7,579,772.241	84.170	0.000m	Crown
5	560,032.263	7,579,770.575	84.253	2.750m	ETW
6	560,033.389	7,579,769.718	83.545	4.165m	Ditch_Out
7	560,033.608	7,579,769.552	83.545	4.440m	Daylight

CHAINAGE 200+720.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,032.023	7,579,783.082	83.786	-4.822m	Daylight
2	560,032.414	7,579,782.809	83.786	-4.346m	Ditch_Out
3	560,033.721	7,579,781.893	84.584	-2.750m	EPS
4	560,035.973	7,579,780.316	84.667	0.000m	Crown
5	560,038.226	7,579,778.738	84.749	2.750m	ETW
6	560,039.385	7,579,777.926	84.042	4.165m	Ditch_Out
7	560,039.677	7,579,777.722	84.042	4.522m	Daylight

CHAINAGE 200+730.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,037.488	7,579,791.227	84.181	-4.824m	Daylight
2	560,037.890	7,579,790.968	84.181	-4.346m	Ditch_Out
3	560,039.233	7,579,790.105	84.979	-2.750m	EPS
4	560,041.546	7,579,788.618	85.061	0.000m	Crown
5	560,043.859	7,579,787.131	85.144	2.750m	ETW
6	560,045.049	7,579,786.366	84.436	4.165m	Hinge
7	560,046.195	7,579,785.630	83.891	5.526m	Daylight

CHAINAGE 200+740.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,042.563	7,579,799.618	84.473	-4.898m	Daylight
2	560,043.039	7,579,799.338	84.473	-4.346m	Ditch_Out
3	560,044.414	7,579,798.529	85.271	-2.750m	EPS
4	560,046.785	7,579,797.135	85.353	0.000m	Crown
5	560,049.155	7,579,795.741	85.436	2.750m	ETW
6	560,050.375	7,579,795.024	84.728	4.165m	Ditch_Out
7	560,050.469	7,579,794.968	84.728	4.274m	Daylight

CHAINAGE 200+750.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,047.180	7,579,808.266	84.663	-5.108m	Daylight
2	560,047.851	7,579,807.906	84.663	-4.346m	Ditch_Out
3	560,049.258	7,579,807.152	85.461	-2.750m	EPS
4	560,051.682	7,579,805.853	85.544	0.000m	Crown
5	560,054.106	7,579,804.554	85.626	2.750m	ETW
6	560,055.353	7,579,803.886	84.919	4.165m	Hinge
7	560,056.331	7,579,803.362	84.475	5.274m	Daylight

CHAINAGE 200+760.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,051.945	7,579,816.840	84.751	-4.763m	Daylight
2	560,052.320	7,579,816.658	84.751	-4.346m	Ditch_Out
3	560,053.756	7,579,815.960	85.549	-2.750m	EPS
4	560,056.229	7,579,814.759	85.632	0.000m	Crown
5	560,058.703	7,579,813.557	85.705	2.750m	ETW
6	560,059.984	7,579,812.935	84.993	4.174m	Ditch_Out
7	560,060.164	7,579,812.847	84.993	4.374m	Daylight

CHAINAGE 200+770.000					
POINT	X	Y	Z	OFFSET	STRING CUT

1	560,056.468	7,579,825.686	84.737	-4.440m	Daylight
2	560,056.554	7,579,825.646	84.737	-4.346m	Ditch_Out
3	560,058.000	7,579,824.970	85.535	-2.750m	EPS
4	560,060.491	7,579,823.805	85.618	0.000m	Crown
5	560,062.982	7,579,822.640	85.627	2.750m	ETW
6	560,064.331	7,579,822.009	84.883	4.240m	Ditch_Out
7	560,064.525	7,579,821.918	84.883	4.454m	Daylight
CHAINAGE 200+780.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,059.037	7,579,835.525	83.847	-6.282m	Daylight
2	560,060.791	7,579,834.704	84.621	-4.346m	Hinge
3	560,062.236	7,579,834.028	85.419	-2.750m	ETW
4	560,064.727	7,579,832.863	85.502	0.000m	Crown
5	560,067.218	7,579,831.698	85.455	2.750m	ETW
6	560,068.625	7,579,831.040	84.679	4.303m	Ditch_Out
7	560,068.789	7,579,830.963	84.679	4.484m	Daylight
CHAINAGE 200+790.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,063.345	7,579,844.550	83.673	-6.204m	Daylight
2	560,065.027	7,579,843.763	84.416	-4.346m	Hinge
3	560,066.473	7,579,843.087	85.214	-2.750m	ETW
4	560,068.964	7,579,841.922	85.296	0.000m	Crown
5	560,071.455	7,579,840.756	85.214	2.750m	ETW
6	560,072.900	7,579,840.080	84.416	4.346m	Ditch_Out
7	560,073.259	7,579,839.913	84.416	4.741m	Daylight
CHAINAGE 200+800.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,067.423	7,579,853.682	83.386	-6.378m	Daylight
2	560,069.264	7,579,852.821	84.198	-4.346m	Hinge
3	560,070.710	7,579,852.145	84.996	-2.750m	ETW
4	560,073.201	7,579,850.980	85.079	0.000m	Crown
5	560,075.692	7,579,849.815	84.996	2.750m	ETW
6	560,077.137	7,579,849.139	84.198	4.346m	Ditch_Out
7	560,077.596	7,579,848.924	84.198	4.852m	Daylight
CHAINAGE 200+810.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,071.334	7,579,862.892	83.024	-6.738m	Daylight
2	560,073.501	7,579,861.879	83.981	-4.346m	Hinge
3	560,074.946	7,579,861.203	84.778	-2.750m	ETW
4	560,077.437	7,579,860.038	84.861	0.000m	Crown
5	560,079.928	7,579,858.873	84.778	2.750m	ETW
6	560,081.374	7,579,858.197	83.981	4.346m	Ditch_Out
7	560,081.823	7,579,857.987	83.981	4.841m	Daylight
CHAINAGE 200+820.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,074.887	7,579,872.270	82.575	-7.492m	Daylight
2	560,077.737	7,579,870.937	83.833	-4.346m	Hinge
3	560,079.183	7,579,870.261	84.631	-2.750m	ETW
4	560,081.674	7,579,869.096	84.714	0.000m	Crown
5	560,084.165	7,579,867.931	84.631	2.750m	ETW
6	560,085.610	7,579,867.255	83.833	4.346m	Ditch_Out
7	560,085.855	7,579,867.141	83.833	4.616m	Daylight
CHAINAGE 200+830.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,078.740	7,579,881.508	82.448	-7.916m	Daylight
2	560,081.974	7,579,879.995	83.876	-4.346m	Hinge
3	560,083.419	7,579,879.319	84.674	-2.750m	ETW
4	560,085.910	7,579,878.154	84.756	0.000m	Crown
5	560,088.401	7,579,876.989	84.674	2.750m	ETW
6	560,089.847	7,579,876.313	83.876	4.346m	Ditch_Out
7	560,089.896	7,579,876.290	83.876	4.400m	Daylight
CHAINAGE 200+840.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,086.020	7,579,889.143	84.111	-4.556m	Daylight
2	560,086.211	7,579,889.054	84.111	-4.346m	Ditch_Out
3	560,087.656	7,579,888.378	84.909	-2.750m	EPS
4	560,090.147	7,579,887.212	84.992	0.000m	Crown
5	560,092.638	7,579,886.047	84.909	2.750m	ETW
6	560,094.084	7,579,885.371	84.111	4.346m	Ditch_Out
7	560,094.154	7,579,885.338	84.111	4.424m	Daylight
CHAINAGE 200+850.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,090.161	7,579,898.246	84.538	-4.662m	Daylight
2	560,090.447	7,579,898.112	84.538	-4.346m	Ditch_Out
3	560,091.893	7,579,897.436	85.336	-2.750m	EPS

4	560,094.384	7,579,896.271	85.419	0.000m	Crown
5	560,096.875	7,579,895.106	85.336	2.750m	ETW
6	560,098.320	7,579,894.430	84.538	4.346m	Ditch_Out
7	560,098.865	7,579,894.175	84.538	4.947m	Daylight
CHAINAGE 200+860.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,094.300	7,579,907.350	85.158	-4.770m	Daylight
2	560,094.684	7,579,907.170	85.158	-4.346m	Ditch_Out
3	560,096.129	7,579,906.494	85.955	-2.750m	EPS
4	560,098.620	7,579,905.329	86.038	0.000m	Crown
5	560,101.111	7,579,904.164	85.955	2.750m	ETW
6	560,102.557	7,579,903.488	85.158	4.346m	Ditch_Out
7	560,102.885	7,579,903.334	85.158	4.708m	Daylight
CHAINAGE 200+870.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,098.537	7,579,916.407	85.969	-4.769m	Daylight
2	560,098.921	7,579,916.228	85.969	-4.346m	Ditch_Out
3	560,100.366	7,579,915.552	86.767	-2.750m	EPS
4	560,102.857	7,579,914.387	86.849	0.000m	Crown
5	560,105.348	7,579,913.222	86.767	2.750m	ETW
6	560,106.793	7,579,912.546	85.969	4.346m	Ditch_Out
7	560,107.313	7,579,912.303	85.969	4.919m	Daylight
CHAINAGE 200+880.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,102.594	7,579,925.550	86.659	-4.968m	Daylight
2	560,103.157	7,579,925.286	86.908	-4.346m	Hinge
3	560,104.603	7,579,924.610	87.705	-2.750m	ETW
4	560,107.094	7,579,923.445	87.788	0.000m	Crown
5	560,109.585	7,579,922.280	87.705	2.750m	ETW
6	560,111.030	7,579,921.604	86.908	4.346m	Ditch_Out
7	560,111.387	7,579,921.437	86.908	4.740m	Daylight
CHAINAGE 200+890.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,106.789	7,579,934.628	87.569	-5.014m	Daylight
2	560,107.394	7,579,934.345	87.836	-4.346m	Hinge
3	560,108.839	7,579,933.669	88.634	-2.750m	ETW
4	560,111.330	7,579,932.503	88.717	0.000m	Crown
5	560,113.821	7,579,931.338	88.642	2.750m	ETW
6	560,115.258	7,579,930.667	87.849	4.336m	Ditch_Out
7	560,115.491	7,579,930.558	87.849	4.593m	Daylight
CHAINAGE 200+900.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,111.169	7,579,943.619	88.449	-4.855m	Daylight
2	560,111.631	7,579,943.403	88.653	-4.346m	Hinge
3	560,113.076	7,579,942.727	89.451	-2.750m	ETW
4	560,115.567	7,579,941.562	89.534	0.000m	Crown
5	560,118.058	7,579,940.397	89.514	2.750m	ETW
6	560,119.436	7,579,939.752	88.754	4.271m	Ditch_Out
7	560,119.701	7,579,939.628	88.754	4.564m	Daylight
CHAINAGE 200+910.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,115.278	7,579,952.736	89.078	-4.996m	Daylight
2	560,115.867	7,579,952.461	89.338	-4.346m	Hinge
3	560,117.313	7,579,951.785	90.136	-2.750m	ETW
4	560,119.804	7,579,950.620	90.218	0.000m	Crown
5	560,122.295	7,579,949.455	90.254	2.750m	ETW
6	560,123.619	7,579,948.835	89.523	4.212m	Ditch_Out
7	560,123.790	7,579,948.755	89.523	4.401m	Daylight
CHAINAGE 200+920.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,119.323	7,579,961.545	89.668	-4.878m	Daylight
2	560,119.810	7,579,961.354	89.877	-4.356m	Hinge
3	560,121.304	7,579,960.765	90.680	-2.750m	ETW
4	560,123.862	7,579,959.757	90.770	0.000m	Crown
5	560,126.421	7,579,958.749	90.861	2.750m	ETW
6	560,127.730	7,579,958.233	90.157	4.157m	Ditch_Out
7	560,128.086	7,579,958.092	90.157	4.540m	Daylight
CHAINAGE 200+930.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,121.918	7,579,970.686	89.897	-5.347m	Daylight
2	560,122.868	7,579,970.416	90.292	-4.359m	Hinge
3	560,124.416	7,579,969.977	91.097	-2.750m	ETW
4	560,127.062	7,579,969.227	91.190	0.000m	Crown
5	560,129.708	7,579,968.476	91.284	2.750m	ETW
6	560,131.059	7,579,968.093	90.581	4.154m	Ditch_Out

7	560,131.644	7,579,967.927	90.581	4.762m	Daylight
CHAINAGE 200+940.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,123.953	7,579,979.927	90.146	-5.443m	Daylight
2	560,125.019	7,579,979.736	90.579	-4.359m	Hinge
3	560,126.604	7,579,979.452	91.384	-2.750m	ETW
4	560,129.310	7,579,978.967	91.477	0.000m	Crown
5	560,132.017	7,579,978.481	91.571	2.750m	ETW
6	560,133.400	7,579,978.234	90.869	4.154m	Ditch_Out
7	560,134.682	7,579,978.004	90.869	5.457m	Daylight
CHAINAGE 200+950.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,125.035	7,579,989.317	90.278	-5.567m	Daylight
2	560,126.239	7,579,989.222	90.761	-4.359m	Hinge
3	560,127.843	7,579,989.096	91.565	-2.750m	ETW
4	560,130.585	7,579,988.881	91.659	0.000m	Crown
5	560,133.326	7,579,988.666	91.752	2.750m	ETW
6	560,134.727	7,579,988.556	91.050	4.154m	Ditch_Out
7	560,135.641	7,579,988.484	91.050	5.071m	Daylight
CHAINAGE 200+960.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,125.247	7,579,998.756	90.427	-5.627m	Daylight
2	560,126.515	7,579,998.783	90.934	-4.359m	Hinge
3	560,128.124	7,579,998.816	91.738	-2.750m	ETW
4	560,130.873	7,579,998.873	91.832	0.000m	Crown
5	560,133.622	7,579,998.929	91.925	2.750m	ETW
6	560,135.027	7,579,998.959	91.223	4.154m	Ditch_Out
7	560,136.187	7,579,998.982	91.223	5.315m	Daylight
CHAINAGE 200+970.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,125.485	7,580,008.280	91.107	-4.721m	Daylight
2	560,125.844	7,580,008.323	91.107	-4.359m	Ditch_Out
3	560,127.442	7,580,008.516	91.911	-2.750m	EPS
4	560,130.172	7,580,008.844	92.005	0.000m	Crown
5	560,132.903	7,580,009.172	92.098	2.750m	ETW
6	560,134.297	7,580,009.340	91.396	4.154m	Ditch_Out
7	560,134.346	7,580,009.346	91.396	4.204m	Daylight
CHAINAGE 200+980.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,123.542	7,580,017.598	91.333	-5.067m	Daylight
2	560,124.247	7,580,017.754	91.333	-4.346m	Ditch_Out
3	560,125.805	7,580,018.101	92.130	-2.750m	EPS
4	560,128.489	7,580,018.697	92.213	0.000m	Crown
5	560,131.174	7,580,019.294	92.295	2.750m	ETW
6	560,132.556	7,580,019.601	91.587	4.166m	Hinge
7	560,134.148	7,580,019.955	90.935	5.797m	Daylight
CHAINAGE 200+990.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,121.367	7,580,027.123	91.691	-4.773m	Daylight
2	560,121.780	7,580,027.235	91.691	-4.346m	Ditch_Out
3	560,123.319	7,580,027.653	92.489	-2.750m	EPS
4	560,125.973	7,580,028.374	92.571	0.000m	Crown
5	560,128.627	7,580,029.096	92.598	2.750m	ETW
6	560,130.047	7,580,029.481	91.863	4.221m	Ditch_Out
7	560,130.067	7,580,029.487	91.863	4.242m	Daylight
CHAINAGE 201+000.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,116.990	7,580,036.296	91.310	-6.591m	Daylight
2	560,119.157	7,580,036.885	92.209	-4.346m	Hinge
3	560,120.697	7,580,037.303	93.006	-2.750m	ETW
4	560,123.351	7,580,038.024	93.089	0.000m	Crown
5	560,126.004	7,580,038.746	93.061	2.750m	ETW
6	560,127.482	7,580,039.147	92.295	4.281m	Ditch_Out
7	560,127.754	7,580,039.221	92.295	4.563m	Daylight
CHAINAGE 201+010.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,116.348	7,580,046.484	92.885	-4.539m	Daylight
2	560,116.535	7,580,046.535	92.885	-4.346m	Ditch_Out
3	560,118.075	7,580,046.953	93.683	-2.750m	EPS
4	560,120.728	7,580,047.674	93.766	0.000m	Crown
5	560,123.382	7,580,048.396	93.683	2.750m	ETW
6	560,124.922	7,580,048.814	92.885	4.346m	Ditch_Out
7	560,125.665	7,580,049.016	92.885	5.116m	Daylight
CHAINAGE 201+020.000					

POINT	X	Y	Z	OFFSET	STRING CUT
1	560,113.439	7,580,056.056	93.722	-4.836m	Daylight
2	560,113.912	7,580,056.185	93.721	-4.346m	Ditch_Out
3	560,115.452	7,580,056.603	94.519	-2.750m	EPS
4	560,118.106	7,580,057.324	94.602	0.000m	Crown
5	560,120.760	7,580,058.046	94.519	2.750m	ETW
6	560,122.299	7,580,058.464	93.721	4.346m	Ditch_Out
7	560,122.486	7,580,058.515	93.721	4.539m	Daylight
CHAINAGE 201+030.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,110.843	7,580,065.713	94.691	-4.808m	Daylight
2	560,111.290	7,580,065.835	94.691	-4.346m	Ditch_Out
3	560,112.830	7,580,066.253	95.489	-2.750m	EPS
4	560,115.483	7,580,066.974	95.572	0.000m	Crown
5	560,118.137	7,580,067.696	95.489	2.750m	ETW
6	560,119.677	7,580,068.114	94.691	4.346m	Ditch_Out
7	560,120.033	7,580,068.211	94.691	4.715m	Daylight
CHAINAGE 201+040.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,108.120	7,580,075.372	95.676	-4.953m	Daylight
2	560,108.708	7,580,075.527	95.676	-4.346m	Ditch_Out
3	560,110.251	7,580,075.935	96.474	-2.750m	EPS
4	560,112.909	7,580,076.637	96.557	0.000m	Crown
5	560,115.568	7,580,077.340	96.474	2.750m	ETW
6	560,117.111	7,580,077.748	95.676	4.346m	Ditch_Out
7	560,117.372	7,580,077.817	95.676	4.616m	Daylight
CHAINAGE 201+050.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,105.509	7,580,085.025	96.661	-5.012m	Daylight
2	560,106.153	7,580,085.195	96.661	-4.346m	Ditch_Out
3	560,107.695	7,580,085.603	97.459	-2.750m	EPS
4	560,110.354	7,580,086.305	97.542	0.000m	Crown
5	560,113.013	7,580,087.008	97.459	2.750m	ETW
6	560,114.556	7,580,087.416	96.661	4.346m	Ditch_Out
7	560,114.876	7,580,087.500	96.661	4.677m	Daylight
CHAINAGE 201+060.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,102.832	7,580,094.661	97.641	-5.137m	Daylight
2	560,103.598	7,580,094.863	97.641	-4.346m	Ditch_Out
3	560,105.140	7,580,095.271	98.439	-2.750m	EPS
4	560,107.799	7,580,095.974	98.521	0.000m	Crown
5	560,110.458	7,580,096.676	98.439	2.750m	ETW
6	560,112.001	7,580,097.084	97.641	4.346m	Ditch_Out
7	560,112.588	7,580,097.239	97.641	4.953m	Daylight
CHAINAGE 201+070.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,100.349	7,580,104.348	98.495	-5.063m	Daylight
2	560,101.042	7,580,104.531	98.495	-4.346m	Ditch_Out
3	560,102.585	7,580,104.939	99.293	-2.750m	EPS
4	560,105.244	7,580,105.642	99.375	0.000m	Crown
5	560,107.903	7,580,106.344	99.293	2.750m	ETW
6	560,109.445	7,580,106.752	98.495	4.346m	Ditch_Out
7	560,109.779	7,580,106.840	98.495	4.690m	Daylight
CHAINAGE 201+080.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,097.625	7,580,113.971	99.176	-5.237m	Daylight
2	560,098.487	7,580,114.199	99.176	-4.346m	Ditch_Out
3	560,100.030	7,580,114.607	99.973	-2.750m	EPS
4	560,102.689	7,580,115.310	100.056	0.000m	Crown
5	560,105.348	7,580,116.012	99.973	2.750m	ETW
6	560,106.890	7,580,116.420	99.176	4.346m	Ditch_Out
7	560,107.295	7,580,116.527	99.176	4.764m	Daylight
CHAINAGE 201+090.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,095.461	7,580,123.743	99.683	-4.833m	Daylight
2	560,095.932	7,580,123.867	99.682	-4.346m	Ditch_Out
3	560,097.475	7,580,124.275	100.480	-2.750m	EPS
4	560,100.134	7,580,124.978	100.563	0.000m	Crown
5	560,102.792	7,580,125.680	100.480	2.750m	ETW
6	560,104.335	7,580,126.088	99.682	4.346m	Ditch_Out
7	560,104.409	7,580,126.108	99.682	4.422m	Daylight
CHAINAGE 201+100.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,093.357	7,580,133.530	100.016	-4.367m	Daylight
2	560,093.377	7,580,133.535	100.016	-4.346m	Ditch_Out

3	560,094.920	7,580,133.943	100.814	-2.750m	EPS
4	560,097.579	7,580,134.646	100.896	0.000m	Crown
5	560,100.237	7,580,135.348	100.814	2.750m	ETW
6	560,101.780	7,580,135.756	100.016	4.346m	Ditch_Out
7	560,101.972	7,580,135.807	100.016	4.544m	Daylight
CHAINAGE 201+110.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,089.651	7,580,142.894	99.691	-5.557m	Daylight
2	560,090.822	7,580,143.203	100.175	-4.346m	Hinge
3	560,092.365	7,580,143.611	100.973	-2.750m	ETW
4	560,095.024	7,580,144.314	101.056	0.000m	Crown
5	560,097.682	7,580,145.016	100.973	2.750m	ETW
6	560,099.225	7,580,145.424	100.175	4.346m	Ditch_Out
7	560,099.524	7,580,145.503	100.175	4.655m	Daylight
CHAINAGE 201+120.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,086.746	7,580,152.469	99.546	-5.919m	Daylight
2	560,088.267	7,580,152.871	100.175	-4.346m	Hinge
3	560,089.810	7,580,153.279	100.973	-2.750m	ETW
4	560,092.468	7,580,153.982	101.055	0.000m	Crown
5	560,095.127	7,580,154.685	100.973	2.750m	ETW
6	560,096.670	7,580,155.092	100.175	4.346m	Ditch_Out
7	560,096.907	7,580,155.155	100.175	4.591m	Daylight
CHAINAGE 201+130.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,084.049	7,580,162.100	99.455	-6.066m	Daylight
2	560,085.712	7,580,162.540	100.143	-4.346m	Hinge
3	560,087.255	7,580,162.947	100.941	-2.750m	ETW
4	560,089.913	7,580,163.650	101.023	0.000m	Crown
5	560,092.572	7,580,164.353	100.941	2.750m	ETW
6	560,094.115	7,580,164.760	100.143	4.346m	Ditch_Out
7	560,094.295	7,580,164.808	100.143	4.532m	Daylight
CHAINAGE 201+140.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,083.053	7,580,172.180	100.111	-4.453m	Daylight
2	560,083.157	7,580,172.208	100.111	-4.346m	Ditch_Out
3	560,084.700	7,580,172.615	100.909	-2.750m	EPS
4	560,087.358	7,580,173.318	100.991	0.000m	Crown
5	560,090.017	7,580,174.021	100.909	2.750m	ETW
6	560,091.560	7,580,174.428	100.111	4.346m	Ditch_Out
7	560,091.924	7,580,174.525	100.111	4.723m	Daylight
CHAINAGE 201+150.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,080.470	7,580,181.841	100.079	-4.482m	Daylight
2	560,080.602	7,580,181.876	100.079	-4.346m	Ditch_Out
3	560,082.144	7,580,182.283	100.877	-2.750m	EPS
4	560,084.803	7,580,182.986	100.959	0.000m	Crown
5	560,087.462	7,580,183.689	100.877	2.750m	ETW
6	560,089.005	7,580,184.096	100.079	4.346m	Ditch_Out
7	560,089.428	7,580,184.208	100.079	4.783m	Daylight
CHAINAGE 201+160.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,077.642	7,580,191.437	100.061	-4.764m	Daylight
2	560,078.047	7,580,191.544	100.061	-4.346m	Ditch_Out
3	560,079.589	7,580,191.952	100.859	-2.750m	EPS
4	560,082.248	7,580,192.654	100.941	0.000m	Crown
5	560,084.907	7,580,193.357	100.859	2.750m	ETW
6	560,086.450	7,580,193.764	100.061	4.346m	Ditch_Out
7	560,086.716	7,580,193.835	100.061	4.621m	Daylight
CHAINAGE 201+170.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,075.066	7,580,201.100	100.153	-4.786m	Daylight
2	560,075.492	7,580,201.212	100.153	-4.346m	Ditch_Out
3	560,077.035	7,580,201.620	100.951	-2.750m	EPS
4	560,079.693	7,580,202.322	101.033	0.000m	Crown
5	560,082.352	7,580,203.025	100.951	2.750m	ETW
6	560,083.895	7,580,203.433	100.153	4.346m	Hinge
7	560,085.071	7,580,203.743	99.666	5.563m	Daylight
CHAINAGE 201+180.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,072.590	7,580,210.789	100.373	-4.704m	Daylight
2	560,072.937	7,580,210.880	100.373	-4.346m	Ditch_Out
3	560,074.480	7,580,211.288	101.170	-2.750m	EPS
4	560,077.139	7,580,211.990	101.253	0.000m	Crown
5	560,079.797	7,580,212.693	101.170	2.750m	ETW

6	560,081.340	7,580,213.101	100.373	4.346m	Hinge
7	560,082.240	7,580,213.338	100.000	5.276m	Daylight
CHAINAGE 201+190.000					
POINT	X	Y	Z	OFFSET	STRING CUT
1	560,070.165	7,580,220.491	100.720	-4.571m	Daylight
2	560,070.383	7,580,220.548	100.720	-4.346m	Ditch_Out
3	560,071.925	7,580,220.956	101.518	-2.750m	EPS
4	560,074.584	7,580,221.659	101.600	0.000m	Crown
5	560,077.243	7,580,222.361	101.518	2.750m	ETW
6	560,078.786	7,580,222.769	100.720	4.346m	Hinge
7	560,079.866	7,580,223.054	100.272	5.464m	Daylight





Section - APPENDICES

APPENDIX E – CITY OF SURREY SUPPLEMENTARY STANDARD DRAWING (SSD-R.36) & PILE DETAIL

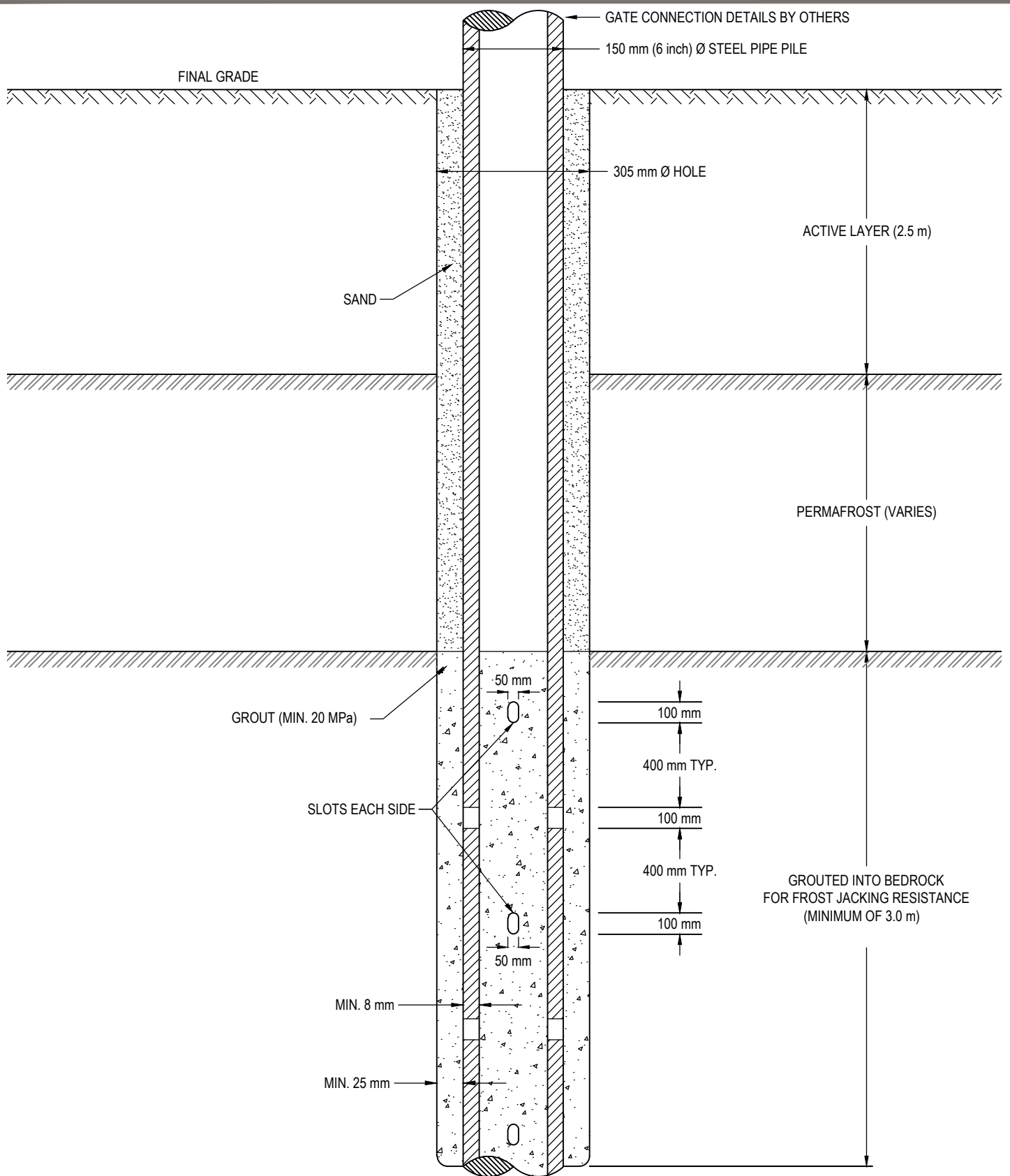


GATE LOCKING PIN DETAIL

1. ALL GATE COMPONENTS TO HAVE PRIME COAT AND TWO COATS OF WHITE ENAMEL PAINT.
2. ALL STEEL TO BE A MINIMUM OF A36 GRADE.

3			All Dimensions Shown In Millimetres, Unless Otherwise Noted
2	APRIL 2020	SCOTT NEUMAN	
1	JANUARY 2016	JAIME BOAN	Title SWING GATE DETAILS
	Revision Date	Approved	
 <div style="display: inline-block; vertical-align: middle; margin-left: 20px;"> <p>SUPPLEMENTARY STANDARD DRAWINGS</p> </div>			Approved By :  <div style="display: flex; justify-content: space-between;"> APRIL 2020 G.M. Engineering </div>
			DRAWING NUMBER SSD-R.36

C:\Debashis\Office Projects\PROJECTS\704-ENG-YARCI\ENG-YARCI\ENG-YARCI\03460-01_FOL Security Fences_Inuvik\03_Acad\ENG-YARCI\03460-01_Figure 2.dwg [FIGURE 2] January 06, 2022 - 11:12:42 am (BY: DAS, DEBASHIS)



NOTE: THIS FIGURE NOT TO SCALE

CLIENT

PSPC & NRCan



TETRA TECH

ROAD REHABILITATION SECURITY GATES
INUVIK SATELLITE STATION FACILITY, NT

ROCK-SOCKETED STEEL PIPE PILE
TYPICAL DETAIL

PROJECT NO.
TRN.VHWY03212-01

DWN

CKD

REV
0

OFFICE
EDMONTON

DATE
JUNE 2022

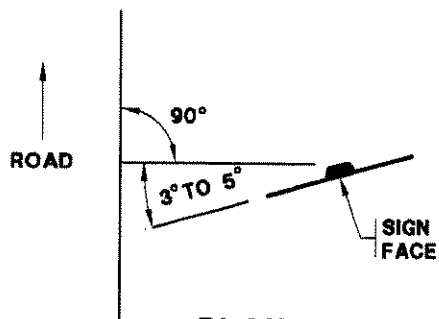
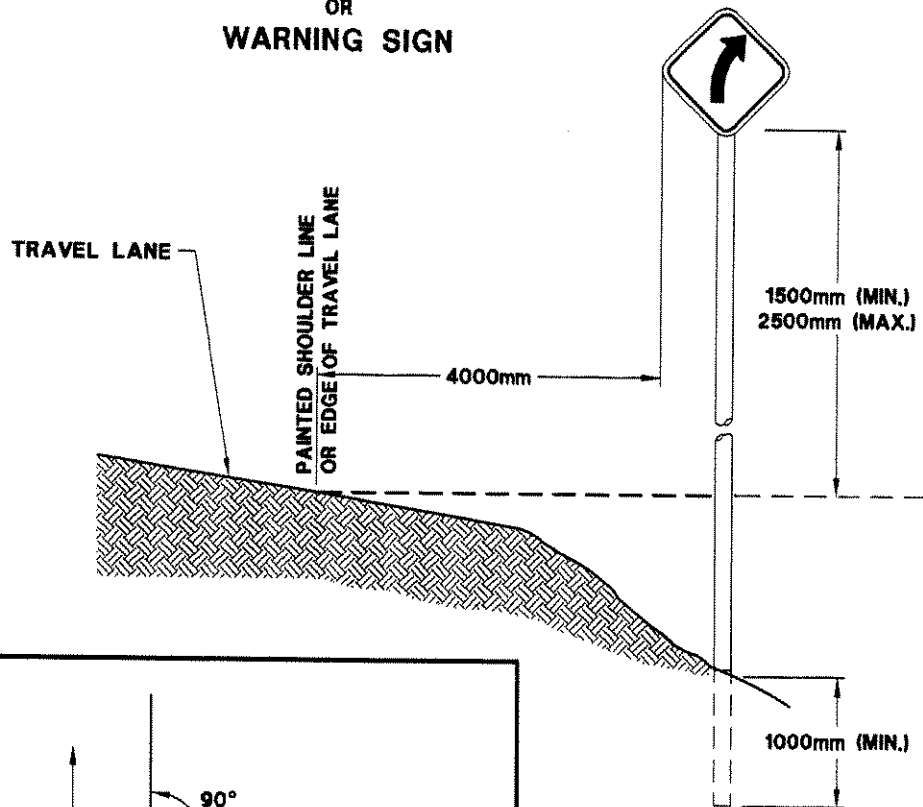
Figure X



Section - APPENDICES

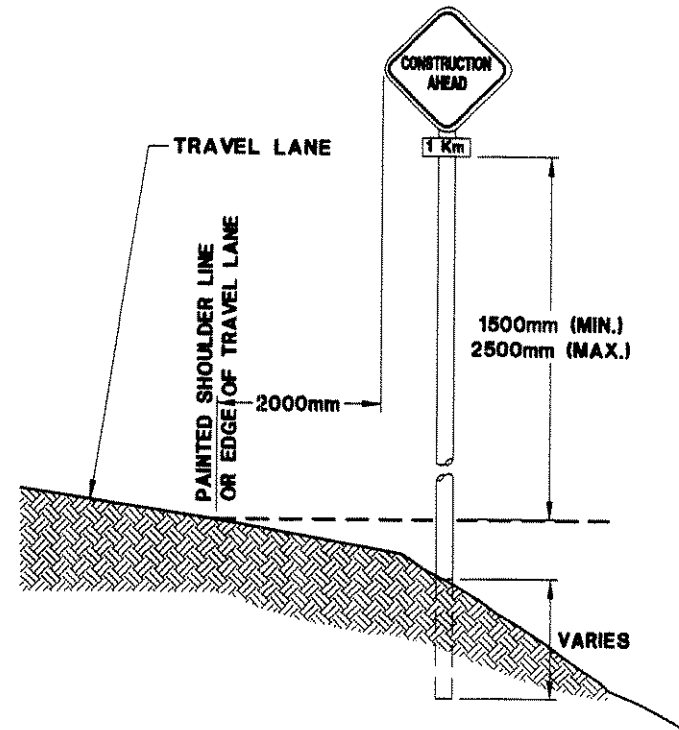
**APPENDIX F – GNWT “BREAKAWAY SIGN POST” (SD-200-02-13) AND “TYPICAL SIGN INSTALLATION
HEIGHT AND LATERAL LOCATIONS” (SD-200-02-12)**

**PERMANENT
REGULATORY
OR
WARNING SIGN**



PLAN VIEW

**TEMPORARY
CONSTRUCTION
WARNING SIGN**



SPECIFICATIONS

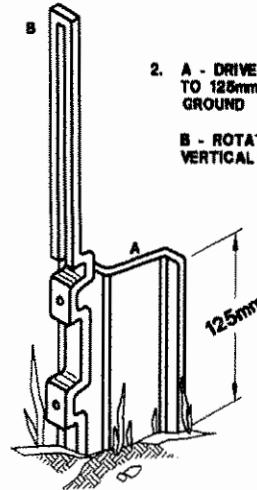
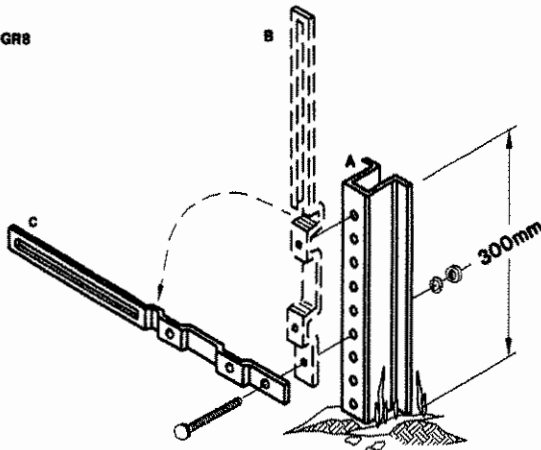
1. **MATERIALS** POSTS SHALL BE PRODUCED FROM HIGH STRENGTH RAIL STEEL ACCORDING TO CSA STANDARD SPECIFICATION G30.12, GRADE 400.
 2. **FINISH** BASE POST AND SIGN POST SHALL BE GALVANIZED, AS PER CSA STANDARD SPECIFICATION G164M.
 3. **BASE POST** THE WEIGHT OF EACH BASE POST BEFORE PUNCHING SHALL BE 2.50 lb/l. BASE POST IS TO BE PUNCHED WITH EIGHTEEN 0.438" DIAMETER HOLES ON A 1.0" CENTER, EXCEPT FOR THE FIRST AND FIFTH HOLES WHICH ARE TO BE 0.438" x 0.500" SLOTS, WITH THE HOLE BEING 1.0" FROM TOP. BASE SHALL BE POINTED AND 1.0 METRE IN LENGTH.
 4. **SIGN POST** THE WEIGHT OF EACH SIGN POST BEFORE PUNCHING SHALL BE 2.50 lb/l. SIGN POST IS TO BE PUNCHED WITH 0.438" DIAMETER HOLES ON A 1.0" CENTER, FULL LENGTH. FIRST AND LAST HOLES SHALL BE 1.0" FROM THE ENDS.
 5. **RETAINER (SPACER STRAP)** MATERIAL SHALL BE AISI 1020 STEEL GALVANIZED TO CSA STANDARD SPECIFICATION G164M, DIMENSIONS ARE AS FOLLOWS: 17.0"(L) x 1.0" (W) x 0.25"(T)
 6. **HARDWARE** BOLTS 3/8" x 16 UNC x 2.00"(L), HEX HEAD, INTEGRAL FLANGE, CONFORMING TO ASTM SPECIFICATION NUMBER A354, GRADE BD
NUTS 3/8" x 16 UNC, HEX HEAD INTEGRAL FLANGE, CONFORMING TO ASTM SPECIFICATION NUMBER A563, GRADE DH
LOCKWASHERS 3/8" EXTRA DUTY HELICAL SPRING
- NOTE: BOLTS, NUTS, AND LOCKWASHERS SHALL BE MECHANICALLY GALVANIZED.

ALL BOLTS 3/8" - 16UNC x 2" - GR8

1. **A - DRIVE BASE POST TO WITHIN 300mm OF GROUND LEVEL**

B-ATTACH RETAINER-SPACER STRAP WITH ONE 3/8" - 16 UNC x 2.0" BOLT, NUT AND LOCKWASHER THROUGH BOTTOM HOLE OF STRAP AND SIXTH HOLE OF BASE POST. SMALL TOP SLOT OF STRAP SHOULD LINE UP WITH TOP HOLE IN BASE POST

C-ROTATE STRAP 90° TO LEFT

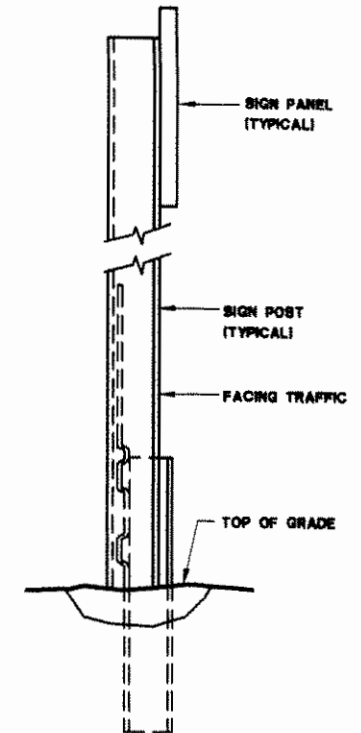
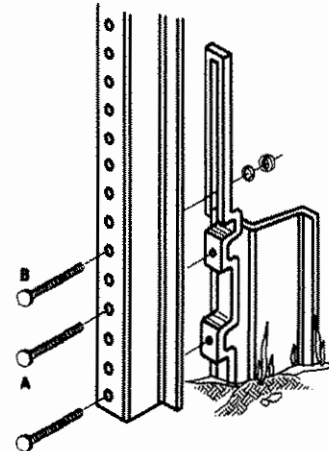


2. **A - DRIVE BASE POST TO 125mm ABOVE GROUND**

B - ROTATE STRAP TO VERTICAL POSITION

3. **A - ATTACH SIGN POST WITH TWO 3/8" - 16 UNC x 2.0" BOLTS, NUTS, AND LOCKWASHERS IN BOTTOM AND FIFTH HOLES. (THESE CORRESPOND WITH SMALL SLOTS IN STRAP.)**

B - INSERT ONE 3/8" - 16 UNC x 2.0" BOLT THROUGH SIGN POST AND BOTTOM ON LONG SLOT IN STRAP. TIGHTEN NUT AND LOCKWASHER SNUGLY BEFORE COMPLETELY TIGHTENING MIDDLE BOLTS.





Section - APPENDICES

APPENDIX G – TETRA TECH GEOTECHNICAL DATA REPORT

Inuvik Satellite Station Facility Road Investigation Inuvik, NT



PRESENTED TO
Public Services and Procurement Canada

JULY 22, 2022
ISSUED FOR REVIEW
FILE: TRN.VHWY03212-01

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2.0	TESTPIT INVESTIGATION	1
2.1	Stratigraphy.....	1
2.1.1	Surface Gravel	1
2.1.2	Embankment Materials	2
3.0	CLOSURE.....	3

APPENDIX SECTIONS

FIGURES

Figure 1 Testpit Location Plan

APPENDICES

Appendix A	Testpit Logs and Laboratory Test Results
Appendix B	Photo Log
Appendix C	Tetra Tech's Limitations on Use of this Document

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Public Services and Procurement Canada and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Public Services and Procurement Canada, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) completed a geotechnical investigation along the existing Inuvik Satellite Station Facility (ISSF) road alignment, which provides access to proposed satellite dish locations. The total length is approximately 5.5 km and includes three road segments:

- Dish 3 Access: which extends off the Dempster Highway to the north.
- Dish 6 Access: which extends east off Dish 3 Access.
- Dish 2 Access: which extends west off Dish 3 Access.

The investigation included the advancement of testpits and laboratory testing. This document is to provide the factual results of the investigation.

2.0 TESTPIT INVESTIGATION

A total of 16 testpits were advanced during the investigation. Thirteen testpits were advanced along the road, and the remaining three testpits (TP21-04, TP21-09, and TP21-07) were advanced in the turnaround areas. Tetra Tech's representative, Adam Mickey, was on site to monitor the work, observe, document the soils, and collect samples for laboratory testing. The approximate location of the testpits is provided in Figure 1.

The testpits were advanced using a CAT 336 excavator owned and operated by Northwind Construction on April 28 and 29, 2021. Initially, testpits were a maximum of 1.0 m in depth. After several testpits, some consistency in the materials was observed, and the testpits were terminated at shallower depths to minimize the disturbance in the road. Representative samples were collected and returned to Tetra Tech's laboratory in Whitehorse, Yukon, for testing. The testpit logs and laboratory test results are attached at the end of this document in Appendix A.

2.1 Stratigraphy

In general, the road materials include surface gravel overlying embankment material. During the investigation, surface gravel was observed in 14 testpits, but could not be identified in the remaining two testpits. Laboratory testing was performed on the materials. Test results are provided in Appendix A.

2.1.1 Surface Gravel

Two samples of surface gravel were collected during the investigation (TP21-02 and TP21-16). The thin layer of gravel made the collection of a representative sample challenging. A sieve analysis was performed on both samples SA03 and SA18, and the fines content was noted to be 39.8% and 10.8%, respectively. The high fines content in SA03 did not match the field observations made by Tetra Tech personnel, and the sample is considered to be non-representative of the surfacing materials.

The surface gravel is gravel and sand with some silt. The moisture content is approximately 3.5%. The thickness of the surface gravel was approximately 50 mm except in Testpits TP21-02 and TP21-16, where the thickness of surface gravel was 100 mm and 150 mm, respectively. Surface gravel was not observed in Testpits TP21-01 and TP21-07.

2.1.2 Embankment Materials

The road embankment materials ranged from silt with trace to some sand and some gravel to silty sand to gravel and silt or silty gravel materials. The fines content ranged from 31.8% to 86.3%. The fines are mostly classified as low plastic silt, with one sample a medium plastic clay. The liquid limit ranges from 33 to 37, and the plasticity index is 11 for all samples.

The in situ water content of the materials ranged from 12.0% to 21.1%. The optimum dry density and water content were determined from a moisture density relationship test (formerly called the Proctor test). The maximum dry density was measured to be 1,825 kg/m³ at an optimum water content of 15.9%. The California Bearing Ratio test was performed on a composite sample of the materials and is provided in Appendix A.

The pad embankment materials are generally silt with trace to some sand and trace gravel. The fines content ranged from 79.1% to 88.6%.

3.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

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FILE: TRN.VHWY03212-01

Prepared by:
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/jf

FILE: TRN.VHWY03212-01
FILE: TRN.VHWY03212-01
FILE: TRN.VHWY03212-01
ISSUED FOR REVIEW
FILE: TRN.VHWY03212-01
FILE: TRN.VHWY03212-01
FILE: TRN.VHWY03212-01


Prepared by:
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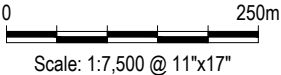
FIGURES

Figure 1 Testpit Location Plan



LEGEND

 TESTPIT



NOTES
BASE DATA: UTM NAD 83 ZONE 8
GOOGLE EARTH IMAGERY

ISSUED FOR REVIEW

CLIENT

PSPC / NRCAN



ISSF ROAD REHABILITATION
INUVIK, NT

TESTPIT LOCATION PLAN

PROJECT NO. VHWY03212	DWN SM	CKD EG	REV 0
OFFICE VANC	DATE JULY 2022		

Figure 1


APPENDIX A

TESTPIT LOGS AND LABORATORY TEST RESULTS

PWGSC			Testpit No: TP21-01							
			Project: ISSF Road Rehabilitation			Project No: TRN.VHWY03212-01				
			Location: Inuvik Satellite Station Facility							
			Inuvik, Northwest Territories			UTM: 558880 E; 7579207 N; Z 8				
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit 20	Moisture Content 40	Liquid Limit 80	Depth (ft)
0	Excavated	SILT - sandy, some gravel, dark brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Frozen		SA01					0
			Vx							1
					SA02	12				2
1		END OF TESTPIT (0.8 metres)								3
2										4
3										5
										6
										7
										8
										9
										10

72°NE (T) 8WN558880N7579208 ±4 m ▲ 41 m

TRN.VHWY03212: ISSF Road Rehabilitation
Photo 1
UTM: 558880 E; 7579207 N; Z 8
28 Apr 2021, 16:20:23


 TETRA TECH	Contractor: Northwind Industries	Completion Depth: 0.8 m
	Drilling Rig Type: CAT 336 Excavator	Start Date: 2021 April 28
	Logged By: AMM	Completion Date: 2021 April 28
	Reviewed By: EAG	Page 1 of 1

PWGSC			Testpit No: TP21-02					
			Project: ISSF Road Rehabilitation		Project No: TRN.VHWY03212-01			
			Location: Inuvik Satellite Station Facility					
			Inuvik, Northwest Territories		UTM: 559521 E; 7579666 N; Z 8			
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit	Depth (ft)
0	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (100 mm thick)	Unfrozen		SA03	10.3	20 40 60 80	0
		SILT - sandy, gravelly, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Frozen Visible ground ice, Vx, Vc		SA04			1
		END OF TESTPIT (0.8 metres)						2
1								3
								4
								5
								6
2								7
								8
								9
3								10

SW240270300330NW360N030

312°NW (T) 8WN559521N7579666 ±5 m ▲ 53 m

TRN.VHWY03212: ISSF Road Rehabilitation
28 Apr 2021, 17:04:42

 TETRA TECH	Contractor: Northwind Industries	Completion Depth: 0.8 m
	Drilling Rig Type: CAT 336 Excavator	Start Date: 2021 April 28
	Logged By: AMM	Completion Date: 2021 April 28
	Reviewed By: EAG	Page 1 of 1

PWGSC		Testpit No: TP21-03								
		Project: ISSF Road Rehabilitation			Project No: TRN.VHWY03212-01					
		Location: Inuvik Satellite Station Facility								
		Inuvik, Northwest Territories			UTM: 560089 E; 7580159 N; Z 8					
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit 20 40 60 80			Depth (ft)
0	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick)	Unfrozen							0
		SAND - silty, some gravel, brown, fine to coarse sand, angular to subangular gravel to 50 mm diameter	Frozen Visible ground ice, Vx		SA05	19				1
		END OF TESTPIT (0.8 metres)								2
1										3
										4
										5
										6
2										7
										8
										9
3										10

84°E (T) 8WN560084N7580160 ±5 m 94 m

TP21-03

TRN.VHWY03212 ISSF Road Rehabilitation

28 Apr 2021 12:38:33


	Contractor: Northwind Industries	Completion Depth: 0.8 m
	Drilling Rig Type: CAT 336 Excavator	Start Date: 2021 April 28
	Logged By: AMM	Completion Date: 2021 April 28
	Reviewed By: EAG	Page 1 of 1



PWGSC		Testpit No: TP21-04						
		Project: ISSF Road Rehabilitation			Project No: TRN.VHWY03212-01			
		Location: Inuvik Satellite Station Facility						
		Inuvik, Northwest Territories			UTM: 560063 E; 7580274 N; Z 8			
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit 20 Moisture Content 40 Liquid Limit 80	Depth (ft)
0	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick) SILT - trace sand, trace gravel, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Unfrozen Frozen Visible ground ice, Vx, Vc					0
				SA06	18.4			1
		END OF TESTPIT (0.8 metres)						2
1								3
								4
								5
								6
2								7
								8
								9
3								10


	Contractor: Northwind Industries	Completion Depth: 0.8 m
	Drilling Rig Type: CAT 336 Excavator	Start Date: 2021 April 28
	Logged By: AMM	Completion Date: 2021 April 28
	Reviewed By: EAG	Page 1 of 1

PWGSC		Testpit No: TP21-05								
		Project: ISSF Road Rehabilitation				Project No: TRN.VHWY03212-01				
		Location: Inuvik Satellite Station Facility								
		Inuvik, Northwest Territories				UTM: 559428 E; 7579978 N; Z 8				
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit 20	Moisture Content 40 60	Liquid Limit 80	Depth (ft)
0	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick) SAND - silty, gravelly, moist when thawed, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Unfrozen Frozen Visible ground ice, Vx, Vc							0
1		END OF TESTPIT (0.9 metres)				SA07	13			1
2										2
3										3
4										4
5										5
6										6
7										7
8										8
9										9
10										10

TETRA TECH	Contractor: Northwind Industries	Completion Depth: 0.9 m
	Drilling Rig Type: CAT 336 Excavator	Start Date: 2021 April 29
	Logged By: AMM	Completion Date: 2021 April 29
	Reviewed By: EAG	Page 1 of 1

PWGSC		Testpit No: TP21-06									
		Project: ISSF Road Rehabilitation					Project No: TRN.VHWY03212-01				
		Location: Inuvik Satellite Station Facility									
		Inuvik, Northwest Territories					UTM: 559365 E; 7580341 N; Z 8				
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit 20 40 60 80			Depth (ft)	
0	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick) SILT - cobbly, trace sand, trace gravel, low plastic, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Unfrozen Frozen Visible ground ice, Vx, Vc						0		
1				SA08	16.1	● —	1				
2		END OF TESTPIT (1.0 metre)							2		
3									3		
									4		
									5		
									6		
									7		
									8		
									9		
									10		
<div><div><div>157°SE (T) ● 8WN559363N7580337 ±7 m ▲ 53 m</div><div></div></div><div>Dish 2 Access: TP21-06</div><div>TRN.VHWY03212- ISSF Road Rehabilitation 29 Apr 2021 08:29:10</div></div>											
<div><div><div>Tt</div><div>TETRA TECH</div></div></div>		Contractor: Northwind Industries					Completion Depth: 1 m				
		Drilling Rig Type: CAT 336 Excavator					Start Date: 2021 April 29				
		Logged By: AMM					Completion Date: 2021 April 29				
		Reviewed By: EAG					Page 1 of 1				

PWGSC		Testpit No: TP21-09									
		Project: ISSF Road Rehabilitation					Project No: TRN.VHWY03212-01				
		Location: Inuvik Satellite Station Facility									
		Inuvik, Northwest Territories					UTM: 559853 E; 7581000 N; Z 8				
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit			Depth (ft)	
							20	40	60		80
0										0	
1	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick)	Unfrozen								
		SILT - trace gravel, trace sand, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Frozen								
			Visible ground ice, Vc								
2											
3											
											
 TETRA TECH		Contractor: Northwind Industries					Completion Depth: 0.5 m				
		Drilling Rig Type: CAT 336 Excavator					Start Date: 2021 April 29				
		Logged By: AMM					Completion Date: 2021 April 29				
		Reviewed By: EAG					Page 1 of 1				



PWGSC		Testpit No: TP21-10							
		Project: ISSF Road Rehabilitation				Project No: TRN.VHWY03212-01			
		Location: Inuvik Satellite Station Facility							
		Inuvik, Northwest Territories				UTM: 560010 E; 7580883 N; Z 8			
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit 20 40 60 80		Depth (ft)
0	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick)	Unfrozen						0
		SILT - sandy, some gravel, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Frozen Visible ground ice, Vc, Vr		SA12				1
		END OF TESTPIT (0.55 metres)							2
1									3
2									4
									5
									6
									7
									8
									9
3									10
									
 TETRA TECH		Contractor: Northwind Industries				Completion Depth: 0.55 m			
		Drilling Rig Type: CAT 336 Excavator				Start Date: 2021 April 29			
		Logged By: AMM				Completion Date: 2021 April 29			
		Reviewed By: EAG				Page 1 of 1			


PWGSC		Testpit No: TP21-11						
		Project: ISSF Road Rehabilitation			Project No: TRN.VHWY03212-01			
		Location: Inuvik Satellite Station Facility						
		Inuvik, Northwest Territories			UTM: 559471 E; 7580668 N; Z 8			
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit	Depth (ft)
0							20 40 60 80	0
	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick)	Unfrozen					
		GRAVEL AND SILT - sandy, low plastic, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Frozen Visible ground ice, Vc, Vr, Vx					
		END OF TESTPIT (0.5 metres)			SA13	18.3	● —	1
1								2
2								3
3								4
								5
								6
								7
								8
								9
								10



271°W (T) 8WN559473N7580668 ±6 m ▲ 73 m

TRN.VHWY03212: ISSF Road Rehabilitation
29 Apr 2021, 11:32:31

	Contractor: Northwind Industries	Completion Depth: 0.5 m
	Drilling Rig Type: CAT 336 Excavator	Start Date: 2021 April 29
	Logged By: AMM	Completion Date: 2021 April 29
	Reviewed By: EAG	Page 1 of 1

PWGSC		Testpit No: TP21-13								
		Project: ISSF Road Rehabilitation				Project No: TRN.VHWY03212-01				
		Location: Inuvik Satellite Station Facility								
		Inuvik, Northwest Territories				UTM: 559451 E; 7579766 N; Z 8				
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit			Depth (ft)
							20 40 60 80			
0									0	
1	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick)	Unfrozen Frozen Visible ground ice, Vr, Vc, Vx		SA15	14.6	●		1	
		GRAVEL AND SILT - sandy, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter								
		END OF TESTPIT (0.5 metres)								
2									2	
3									3	
4									4	
5									5	
6									6	
7									7	
8									8	
9									9	
10									10	
<div><div><div>W270NW330NNE63</div><div>337°NW (T) ● 8WN559451N7579777 ±5 m ▲ 65 m</div><div><div>Dish 3 Access: TP21-13</div><div>TRN.VHWY03212-01 ISSF Road Rehabilitation 2021 April 29 13:40:35</div></div></div></div>										
 TETRA TECH		Contractor: Northwind Industries				Completion Depth: 0.5 m				
		Drilling Rig Type: CAT 336 Excavator				Start Date: 2021 April 29				
		Logged By: AMM				Completion Date: 2021 April 29				
		Reviewed By: EAG				Page 1 of 1				

PWGSC		Testpit No: TP21-14									
		Project: ISSF Road Rehabilitation					Project No: TRN.VHWY03212-01				
		Location: Inuvik Satellite Station Facility									
		Inuvik, Northwest Territories					UTM: 559950 E; 7579697 N; Z 8				
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit			Depth (ft)	
							20	40	60		80
0	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick)	Unfrozen							0	
CLAY - trace sand, trace gravel, medium plastic, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter		Frozen Visible ground ice, Vc, Vr, Vx, ice lenses to 20 mm thick		SA16	20.6				1		
END OF TESTPIT (0.5 metres)										2	
1										3	
2										4	
3										5	
										6	
										7	
										8	
										9	
										10	
<div><div>SE180S180SW270W270</div><div>219°SW (T) 8WN559945N7579697 ±4 m ▲ 70 m</div><div></div><div>ISSF Road Rehabilitation</div></div>											
<div><div>Tt</div><div>TETRA TECH</div></div>		Contractor: Northwind Industries				Completion Depth: 0.5 m					
		Drilling Rig Type: CAT 336 Excavator				Start Date: 2021 April 29					
		Logged By: AMM				Completion Date: 2021 April 29					
		Reviewed By: EAG				Page 1 of 1					

PWGSC		Testpit No: TP21-15									
		Project: ISSF Road Rehabilitation					Project No: TRN.VHWY03212-01				
		Location: Inuvik Satellite Station Facility									
		Inuvik, Northwest Territories					UTM: 559156 E; 7579497 N; Z 8				
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	Plastic Limit Moisture Content Liquid Limit			Depth (ft)	
							20 40 60 80				
0										0	
1	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - trace silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (50 mm thick)	Unfrozen								
		GRAVEL - silty, sandy, some cobbles, brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter	Frozen								
			Visible ground ice, Vc, Vx, Vr								
					SA17	15.7				1	
2		END OF TESTPIT (0.5 metres)									
3											
											
 TETRA TECH		Contractor: Northwind Industries					Completion Depth: 0.5 m				
		Drilling Rig Type: CAT 336 Excavator					Start Date: 2021 April 29				
		Logged By: AMM					Completion Date: 2021 April 29				
		Reviewed By: EAG					Page 1 of 1				

PWGSC		Testpit No: TP21-16								
		Project: ISSF Road Rehabilitation				Project No: TRN.VHWY03212-01				
		Location: Inuvik Satellite Station Facility								
		Inuvik, Northwest Territories				UTM: 558934 E; 7579319 N; Z 8				
Depth (m)	Method	Soil Description	Ground Ice Description	Sample Type	Sample Number	Moisture Content (%)	<div>Plastic Limit Moisture Content Liquid Limit</div> <div>20 40 60 80</div>			Depth (ft)
0	Excavated	GRAVEL AND SAND (SURFACE GRAVEL) - some silt, damp, grey brown, fine to coarse sand, angular to subangular gravel to 25 mm diameter, (150 mm thick)	Unfrozen		SA18	3.5	●			0
GRAVEL AND SAND AND SILT - brown, fine to coarse sand, angular to subangular gravel to 100 mm diameter		Frozen Visible ground ice, Vc		SA19	17.4	●			1	
END OF TESTPIT (0.55 metres)									2	
1										3
2										4
3										5
										6
										7
										8
										9
										10
<div><div><div>210 SW 740 W 270 300 NW 330 N 0</div><div>268°W (T) ● 8WN558926N7579324 ±6 m ▲ 52 m</div><div><div>TRN.VHWY03212: ISSF Road Rehabilitation</div><div>29 Apr 2021, 13:43:14</div></div></div><div>Dish 3 Access: TP21-16</div></div>										
<div><div><div>Tt</div><div>TETRA TECH</div></div></div>		Contractor: Northwind Industries				Completion Depth: 0.55 m				
		Drilling Rig Type: CAT 336 Excavator				Start Date: 2021 April 29				
		Logged By: AMM				Completion Date: 2021 April 29				
		Reviewed By: EAG				Page 1 of 1				

MOISTURE CONTENT TEST RESULTS

ASTM D2216

Page: 1 of 1

[illegible]

Reviewed By: _____ **C.E.T.**

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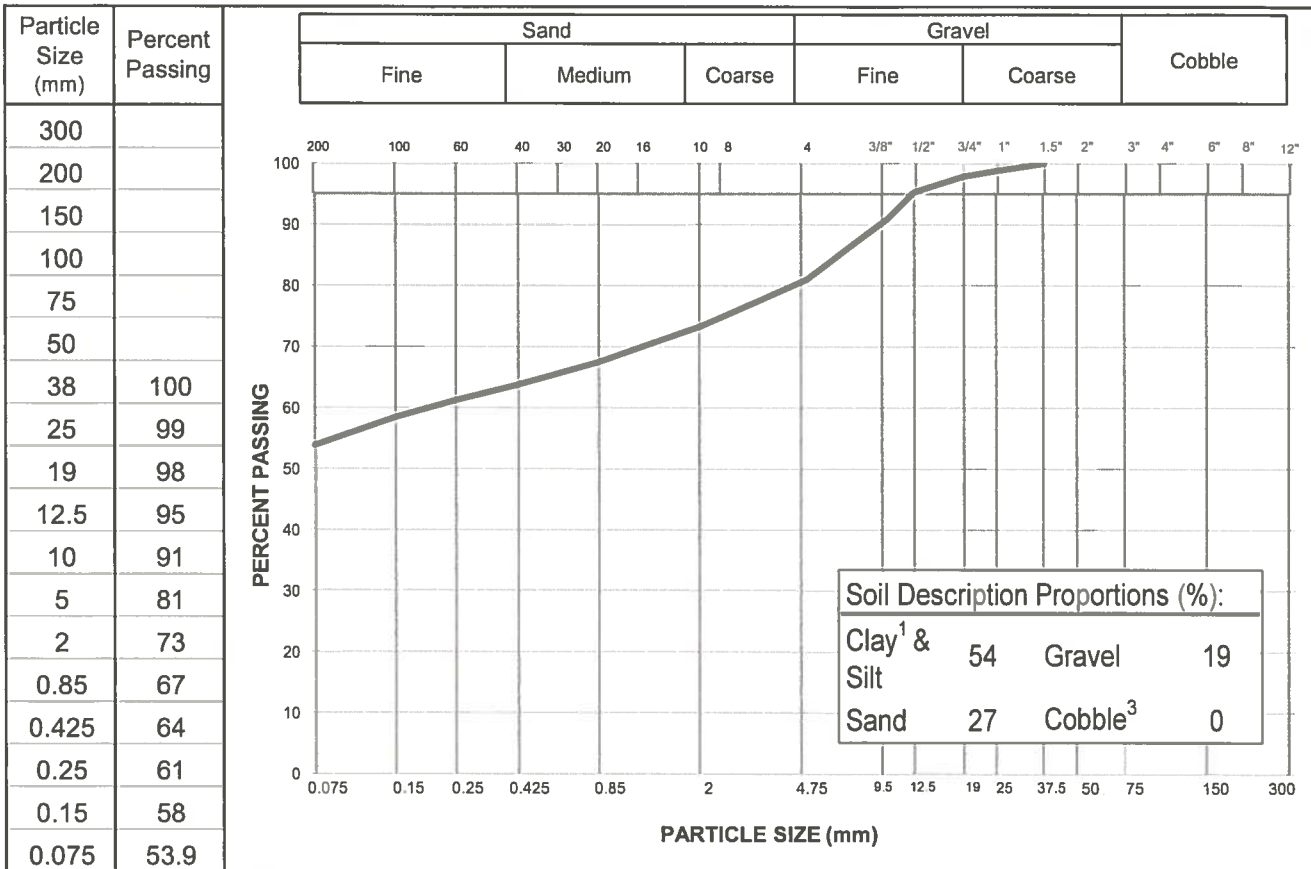
PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation
 Project No.: TRN.VHWY03212-01
 Site: Inuvik, NT
 Client: PWGSC
 Client Rep.: Yakob Woldeyesus
 Date Tested: May 5, 2021 By: BW
 Soil Description²: SILT - sandy, some gravel

Sample No.: SA02
 Material Type: Embankment
 Sample Loc.: TP21-01
 Sample Depth: 0.7m
 Sampling Method: Grab
 Date Sampled: April 28, 2021
 Sampled By: AMM
 USC Classification: ML Cu: #N/A
 Cc: #N/A

Moisture Content: 19.1%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to Tt WM4400 description protocols
³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: _____

C.E.T.

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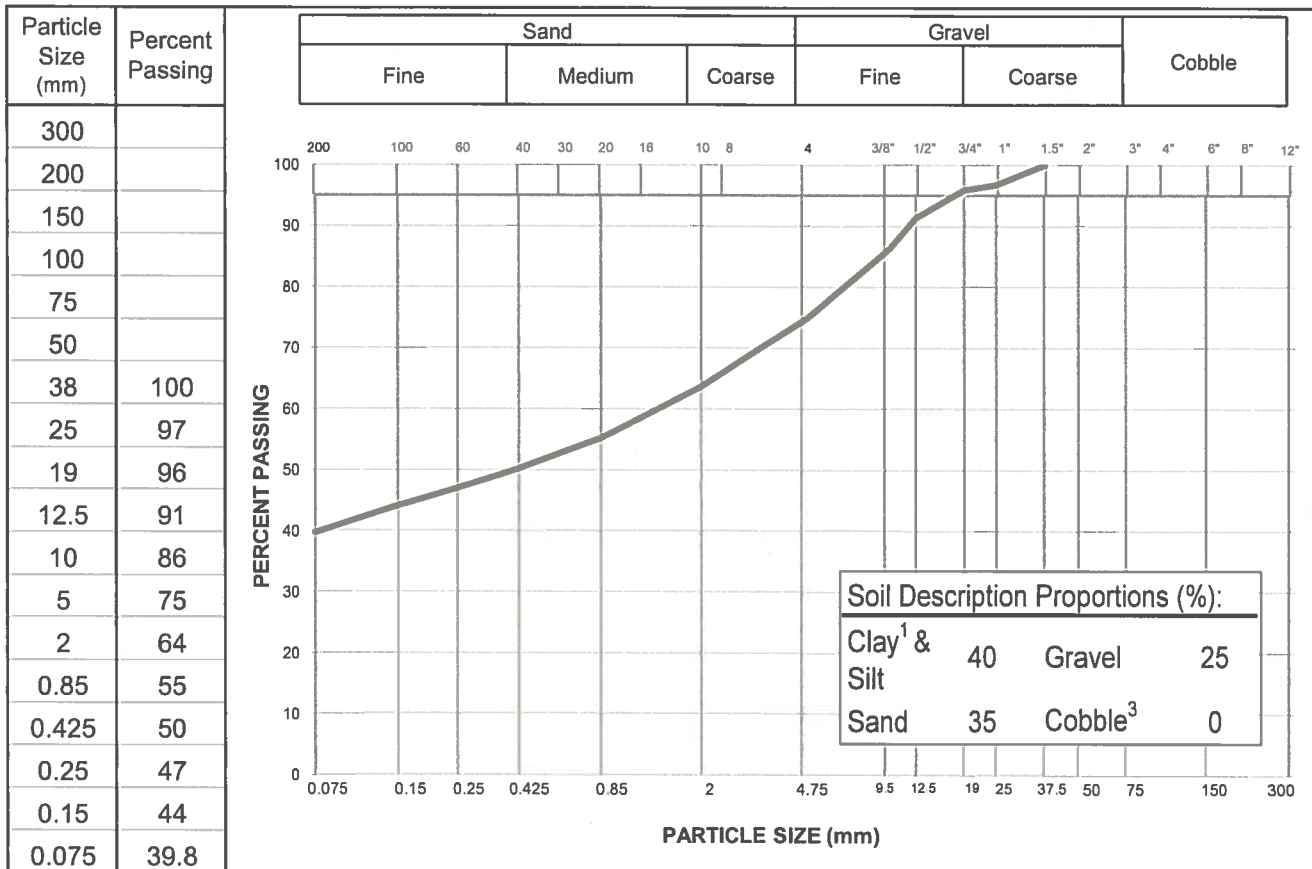
PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation Sample No.: SA03
 Project No.: TRN.VHWY03212-01 Material Type: Surfacing Gravel
 Site: Inuvik, NT Sample Loc.: TP21-02
 Client: PWGSC Sample Depth: 0.1m
 Client Rep.: Yakob Woldeyesus Sampling Method: Grab
 Date Tested: May 5, 2021 By: BW Date Sampled: April 28, 2021
 Soil Description²: SAND and SILT - gravelly Sampled By: AMM

USC Classification: SM Cu: #N/A

Moisture Content: 10.3% Cc: #N/A



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

² The description is visually based & subject to Tt WM4400 description protocols

³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification:

Remarks: Sieve analysis result is not representative of visual assessment

Reviewed By:

C.E.T.

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PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation

Sample No.: SA05

Project No.: TRN.VHWY03212-01

Material Type: Embankment

Site: Inuvik, NT

Sample Loc.: TP21-03

Client: PWGSC

Sample Depth: 0.6m

Client Rep.: Yakob Woldeyesus

Sampling Method: Grab

Date Tested: May 5, 2021 By: BW

Date Sampled: April 28, 2021

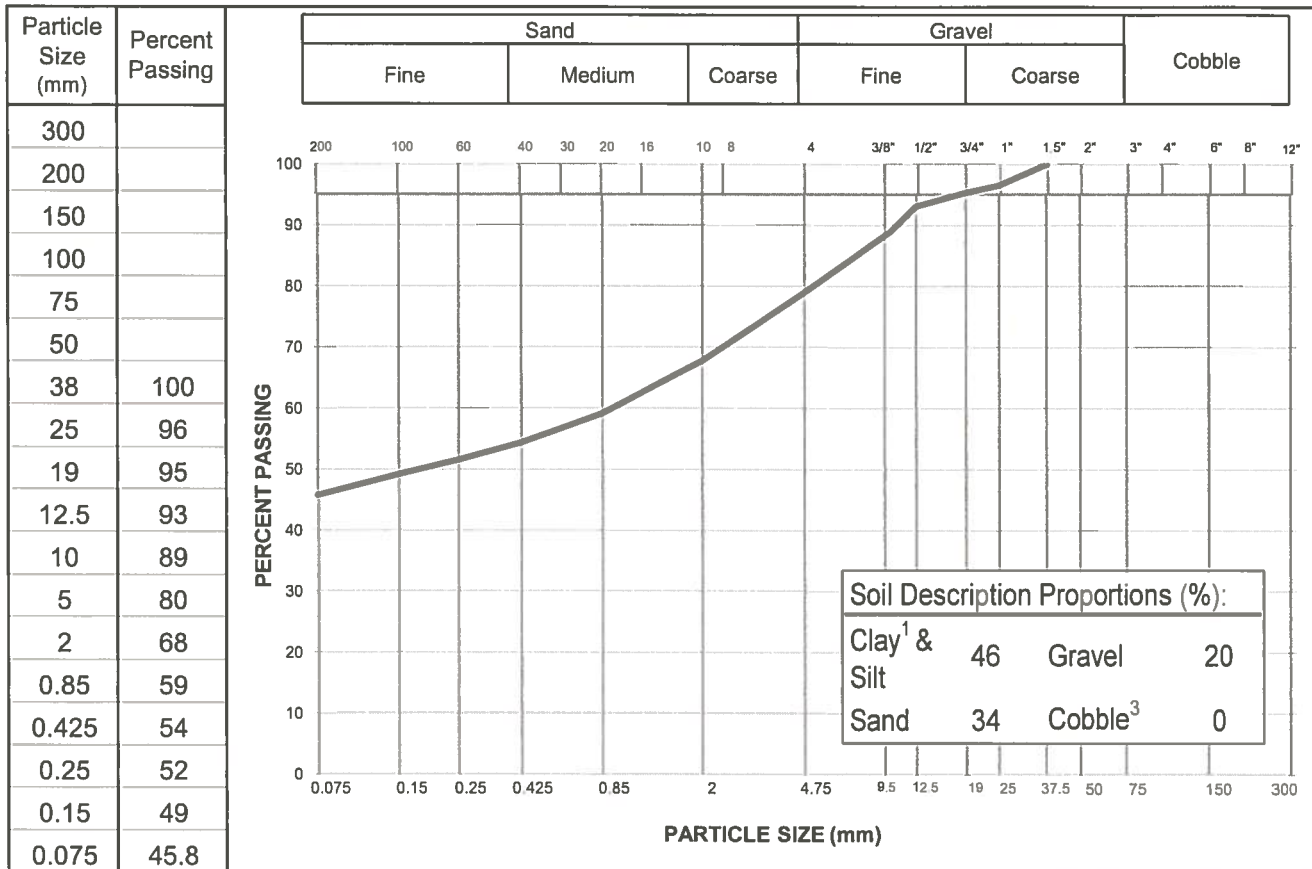
Soil Description²: SAND - silty, some gravel

Sampled By: AMM

USC Classification: ML Cu: #N/A

Moisture Content: 19.0%

Cc: #N/A



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

² The description is visually based & subject to Tt WM4400 description protocols

³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: _____

C.E.T.

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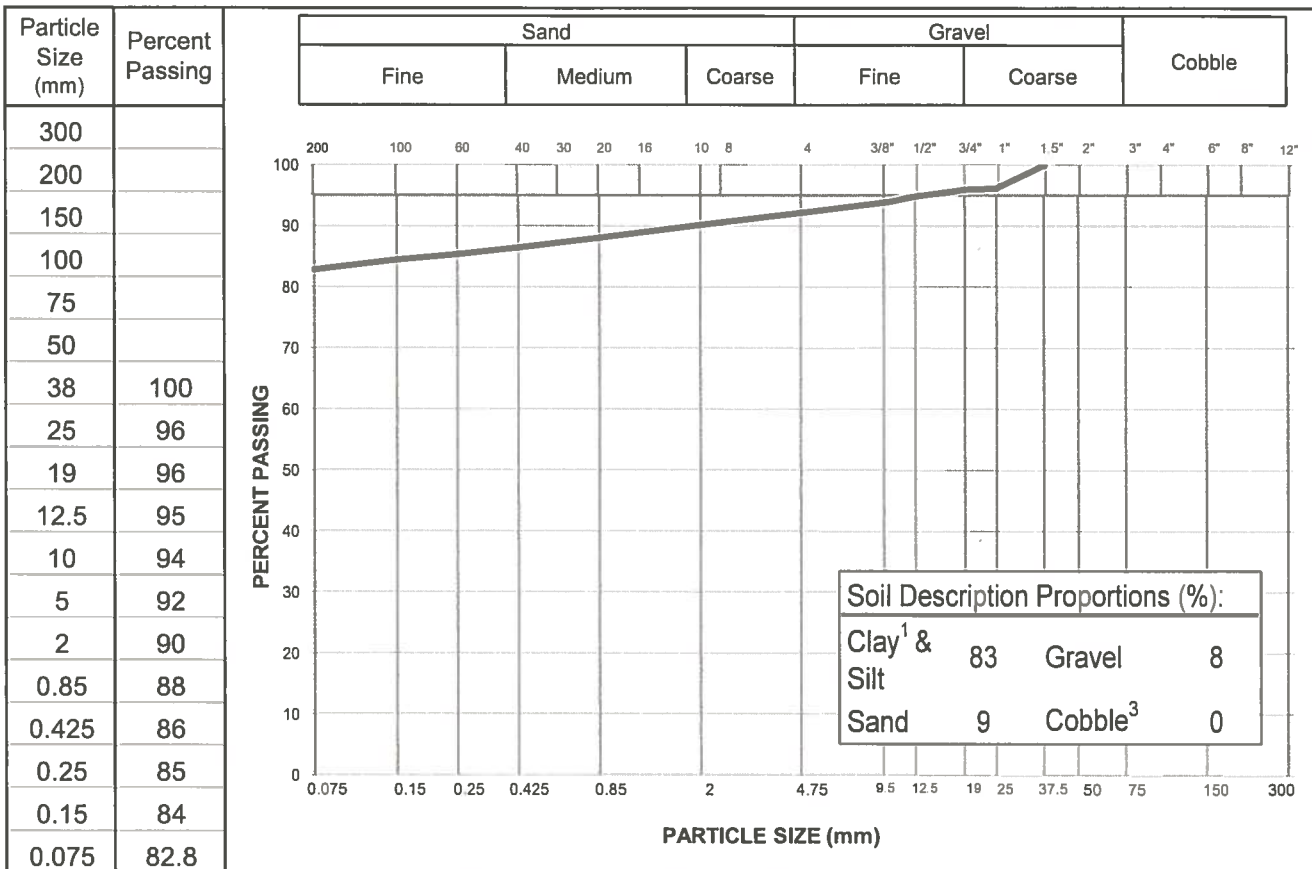
PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation
 Project No.: TRN.VHWY03212-01
 Site: Inuvik, NT
 Client: PWGSC
 Client Rep.: Yakob Woldeyesus
 Date Tested: May 5, 2021 By: BW
 Soil Description²: SILT - trace sand, trace gravel

Sample No.: SA06
 Material Type: Embankment
 Sample Loc.: TP21-04
 Sample Depth: 0.8m
 Sampling Method: Grab
 Date Sampled: April 28, 2021
 Sampled By: AMM
 USC Classification: ML Cu: #N/A
 Cc: #N/A

Moisture Content: 18.4%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

² The description is visually based & subject to Tt WM4400 description protocols

³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification:

Remarks:

Reviewed By:

C.E.T.

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PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation

Sample No.: SA07

Project No.: TRN.VHWY03212-01

Material Type: Embankment

Site: Inuvik, NT

Sample Loc.: TP21-05

Client: PWGSC

Sample Depth: 0.8m

Client Rep.: Yakob Woldeyesus

Sampling Method: Grab

Date Tested: May 5, 2021

By: BW

Date Sampled: April 29, 2021

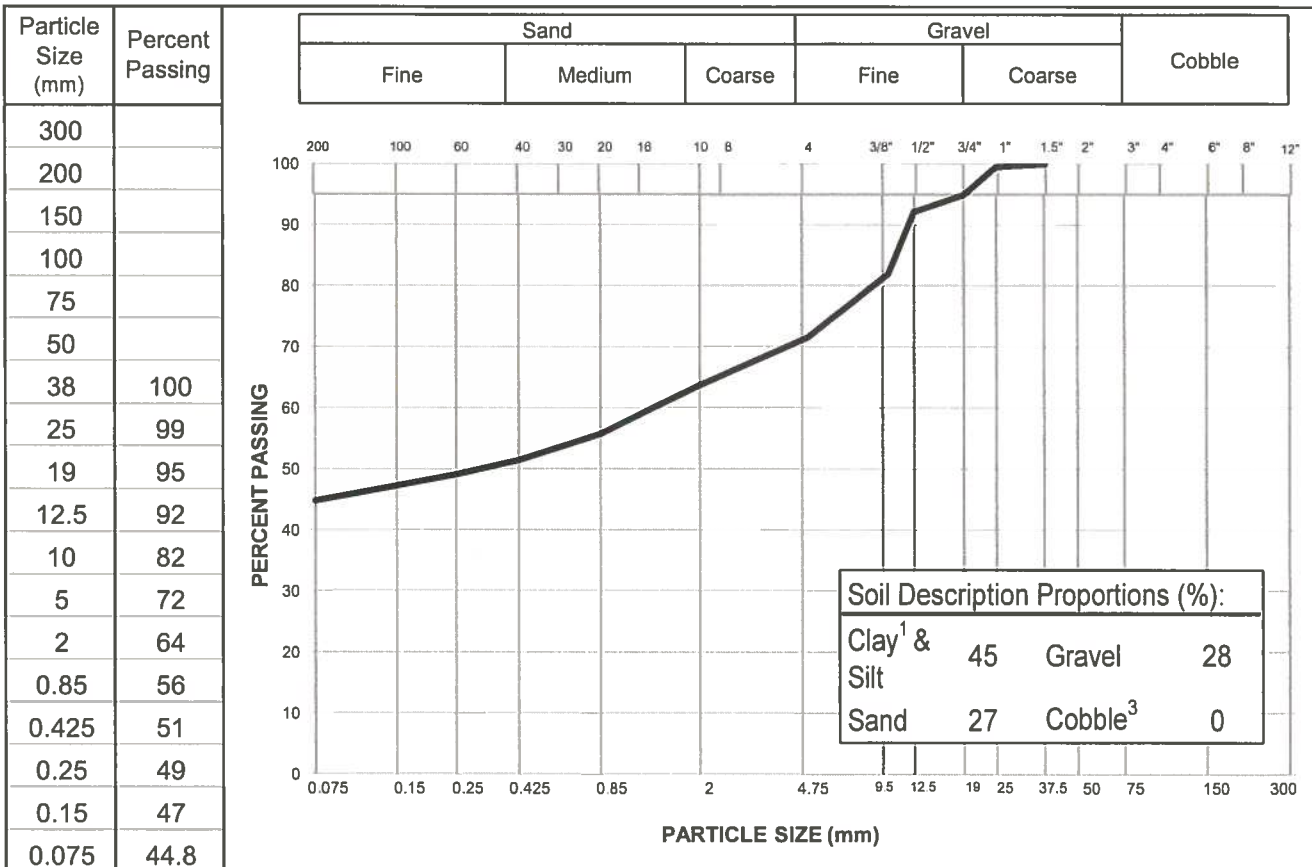
Soil Description²: SAND - silty, gravelly

Sampled By: AMM

USC Classification: SM Cu: #N/A

Cc: #N/A

Moisture Content: 13.0%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

² The description is visually based & subject to Tt WM4400 description protocols

³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: _____

C.E.T.

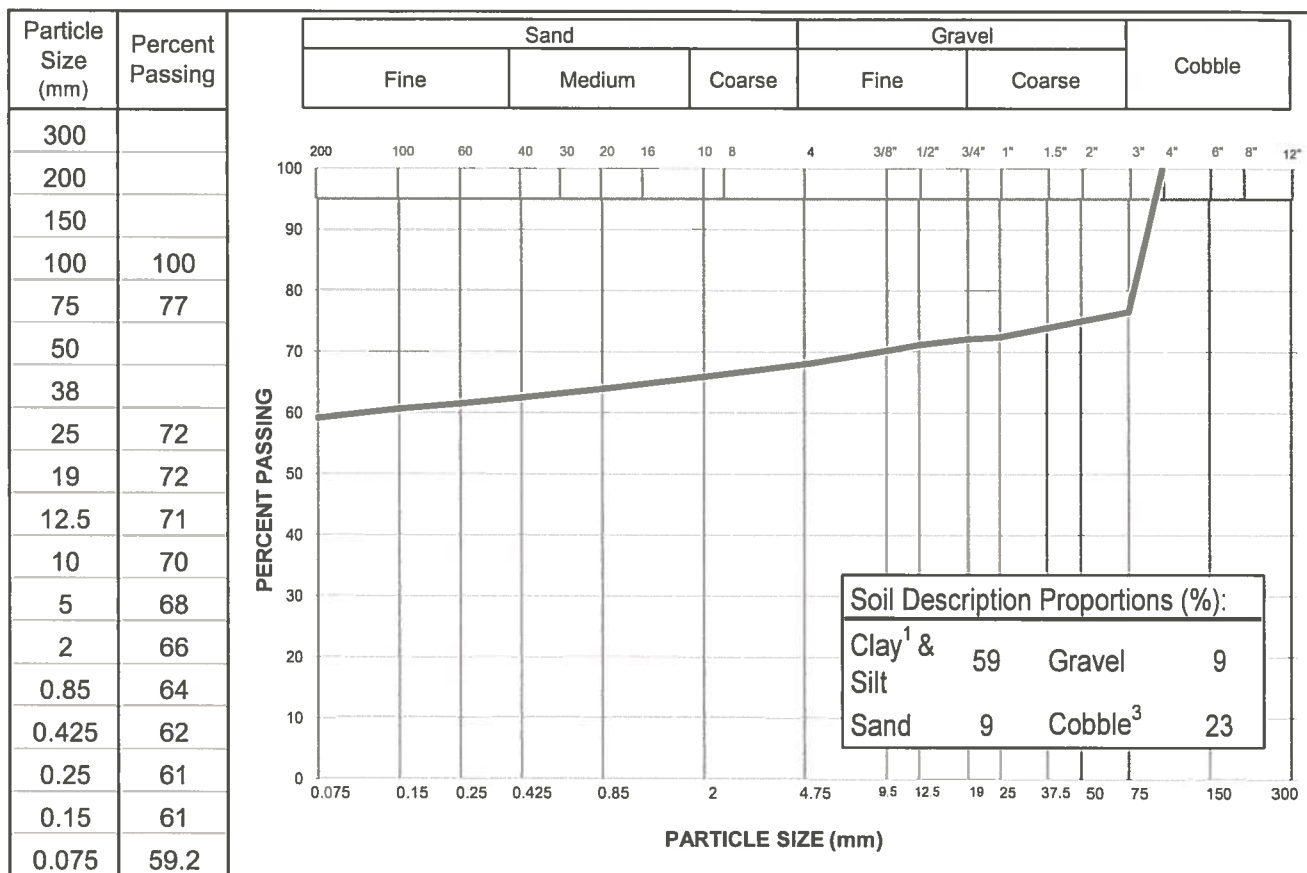
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PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation	Sample No.: SA08
Project No.: TRN.VHWY03212-01	Material Type: Embankment
Site: Inuvik, NT	Sample Loc.: TP21-06
Client: PWGSC	Sample Depth: 0.9m
Client Rep.: Yakob Woldeyesus	Sampling Method: Grab
Date Tested: May 5, 2021 By: BW	Date Sampled: April 29, 2021
Soil Description ² : SILT - cobbley, trace sand, trace gravel	Sampled By: AMM
	USC Classification: ML Cu: #N/A
Moisture Content: 16.1%	Cc: #N/A



Notes: ¹ The upper clay size of 2 μ m, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to Tt WM4400 description protocols
³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: _____

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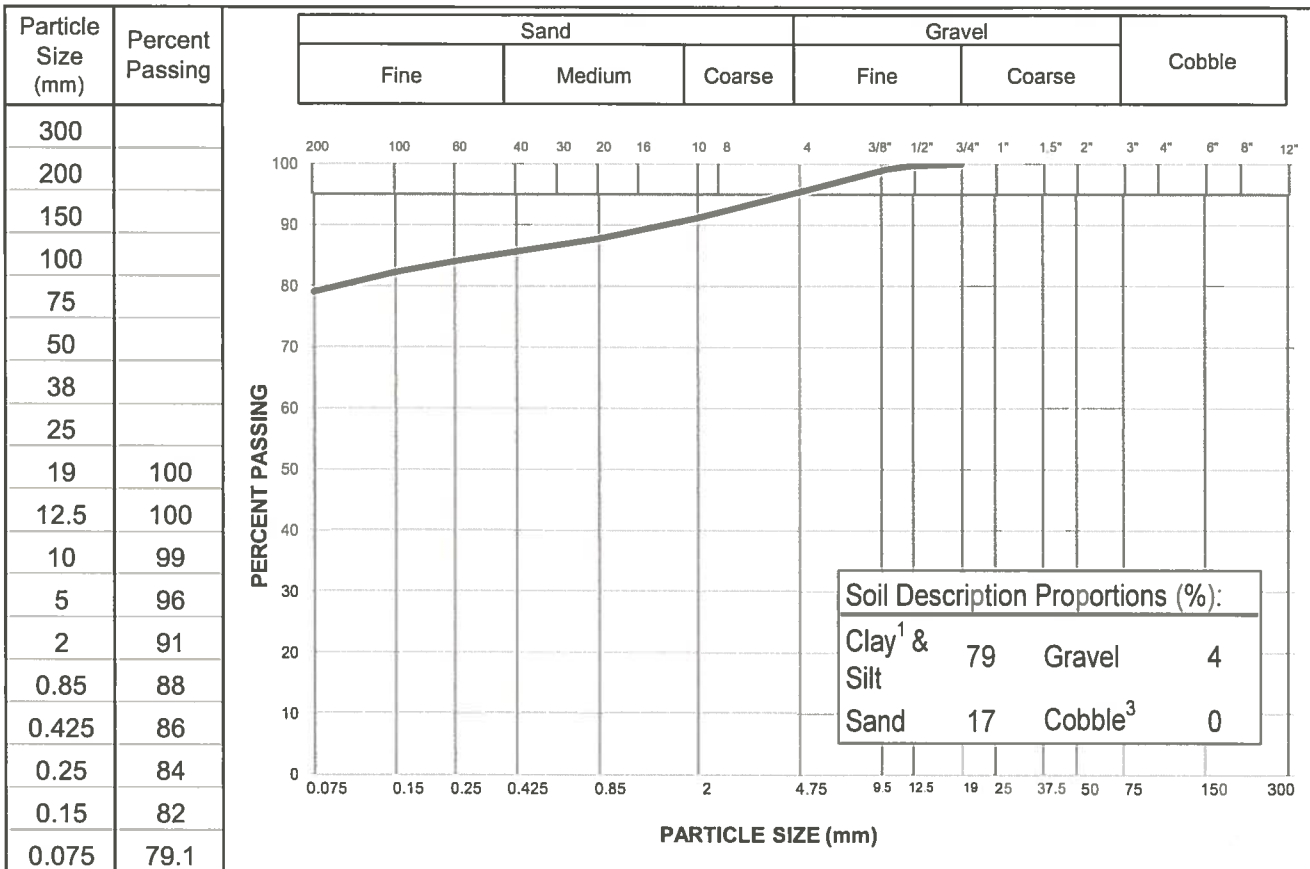
PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation
 Project No.: TRN.VHWY03212-01
 Site: Inuvik, NT
 Client: PWGSC
 Client Rep.: Yakob Woldeyesus
 Date Tested: May 5, 2021 By: BW
 Soil Description²: SILT - some sand, trace gravel

Sample No.: SA09
 Material Type: Embankment
 Sample Loc.: TP21-07
 Sample Depth: 0.7m
 Sampling Method: Grab
 Date Sampled: April 29, 2021
 Sampled By: AMM
 USC Classification: ML Cu: #N/A
 Cc: #N/A

Moisture Content: 21.1%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to Tt WM4400 description protocols
³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: _____

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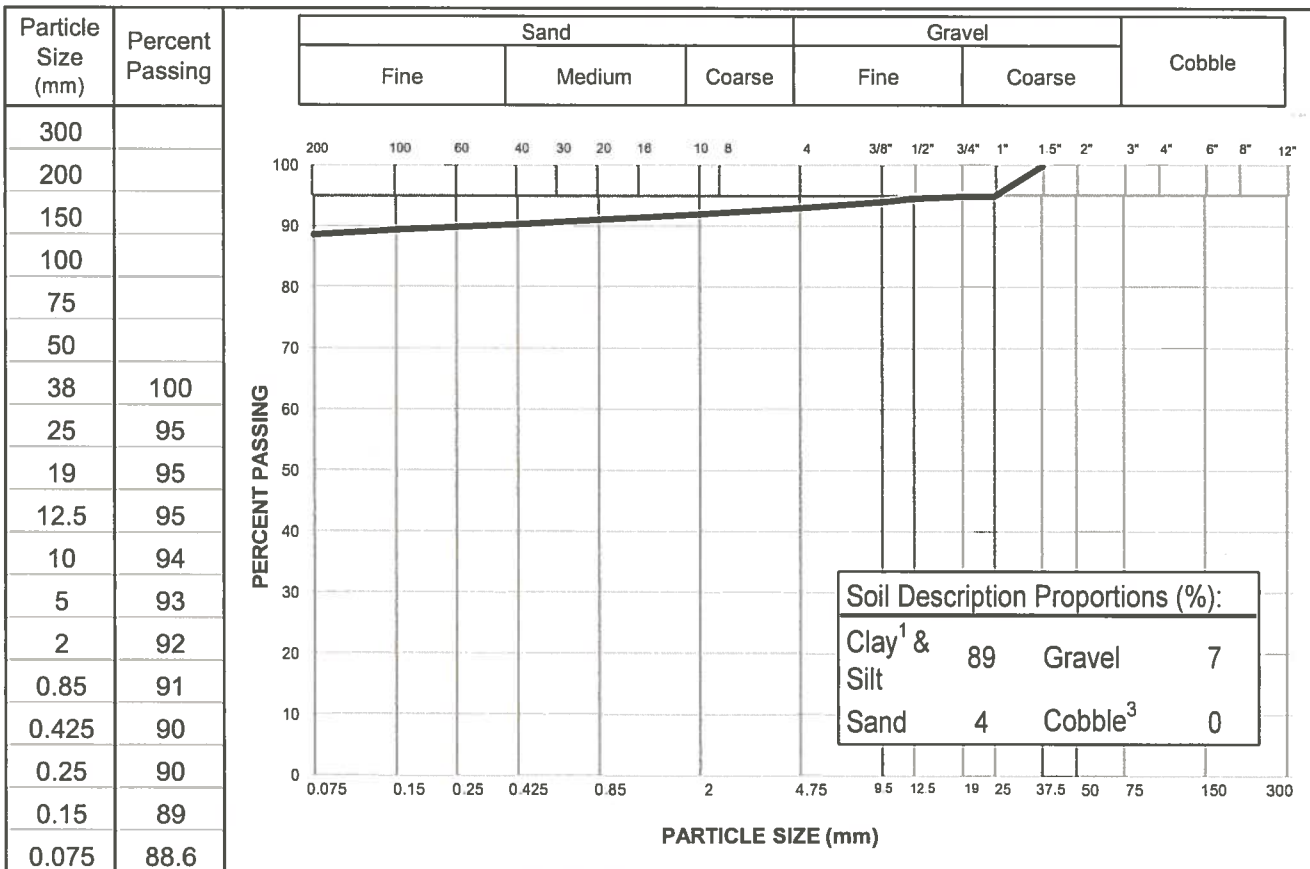
PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation
 Project No.: TRN.VHWY03212-01
 Site: Inuvik, NT
 Client: PWGSC
 Client Rep.: Yakob Woldeyesus
 Date Tested: May 5, 2021 By: BW
 Soil Description²: SILT - trace gravel, trace sand

Sample No.: SA11
 Material Type: Embankment
 Sample Loc.: TP21-09
 Sample Depth: 0.4m
 Sampling Method: Grab
 Date Sampled: April 29, 2021
 Sampled By: AMM
 USC Classification: ML Cu: #N/A
 Cc: #N/A

Moisture Content: 19.4%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

² The description is visually based & subject to Tt WM4400 description protocols

³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification:

Remarks:

Reviewed By:

C.E.T.

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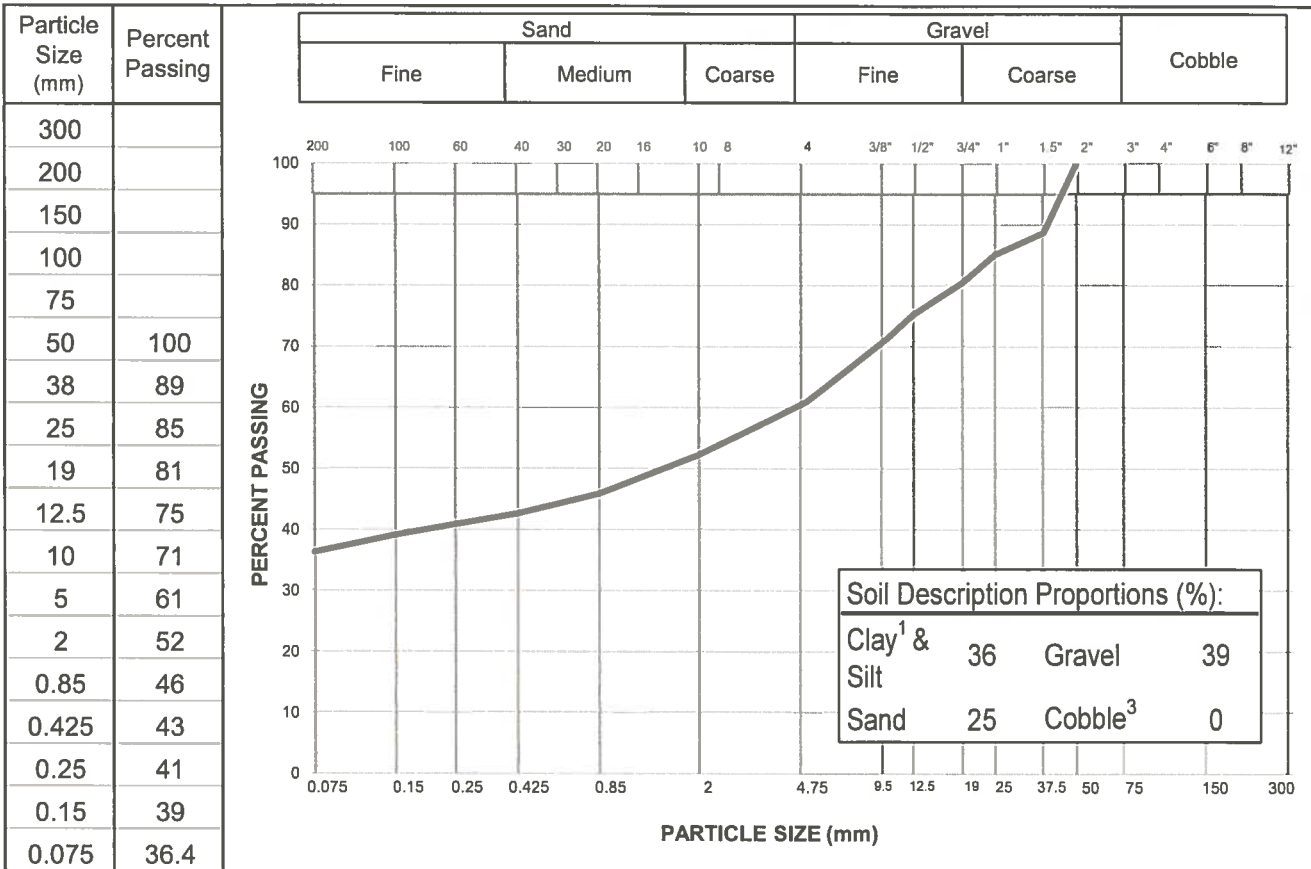
PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation
 Project No.: TRN.VHWY03212-01
 Site: Inuvik, NT
 Client: PWGSC
 Client Rep.: Yakob Woldeyesus
 Date Tested: May 5, 2021 By: BW
 Soil Description²: GRAVEL and SILT - sandy

Sample No.: SA13
 Material Type: Embankment
 Sample Loc.: TP21-11
 Sample Depth: 0.5m
 Sampling Method: Grab
 Date Sampled: April 29, 2021
 Sampled By: AMM
 USC Classification: GM Cu: #N/A
 Cc: #N/A

Moisture Content: 18.3%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to Tt WM4400 description protocols
³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification:

Remarks:

Reviewed By:

C.E.T.

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ATTERBERG LIMITS TEST REPORT

ASTM D4318

Project: ISSF Road Rehabilitation

Sample Number: SA13

Borehole Number: TP21-11

Project No: TRN.VHWY03212-01

Source: Embankment

Client: PWGSC

Sampled By: AMM Tested By: BW

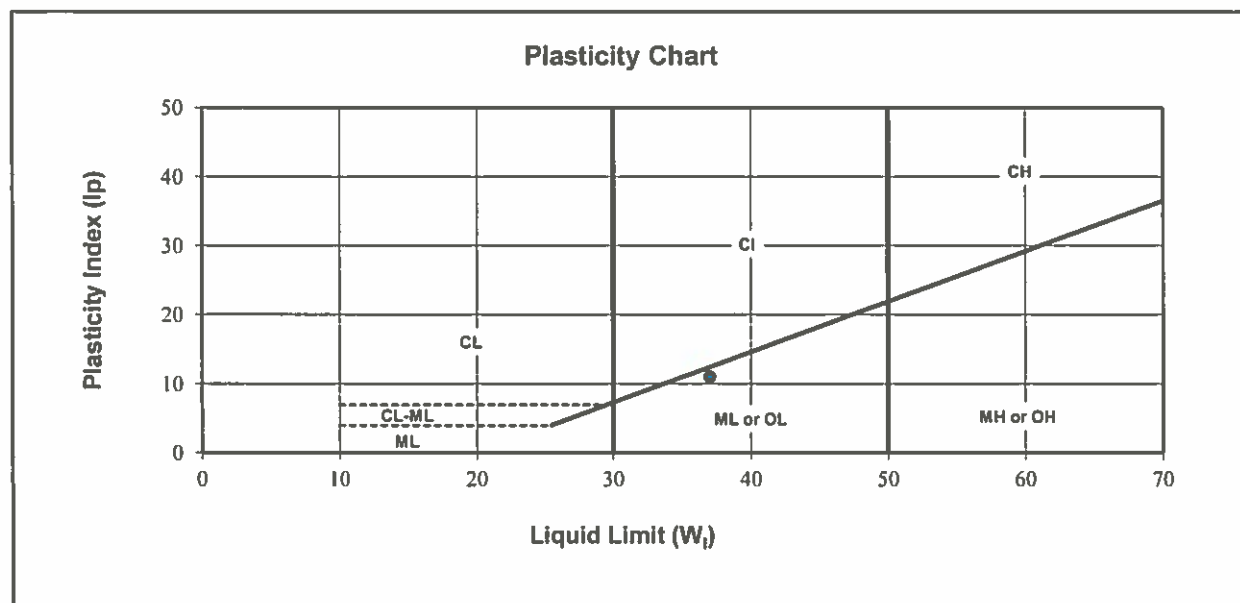
Attention: Yakob Woldeyesus

Date Sampled: April 29, 2021

Email: -

Date Tested: May 5, 2021

Sample Description: GRAVEL and SILT - sandy



Liquid Limit (W_L): 37

Natural Moisture (%): 18.3

Plastic Limit: 26

Soil Plasticity: Low

Plasticity Index (I_p): 11

Mod.USCS Symbol: ML

Remarks:

Reviewed By:

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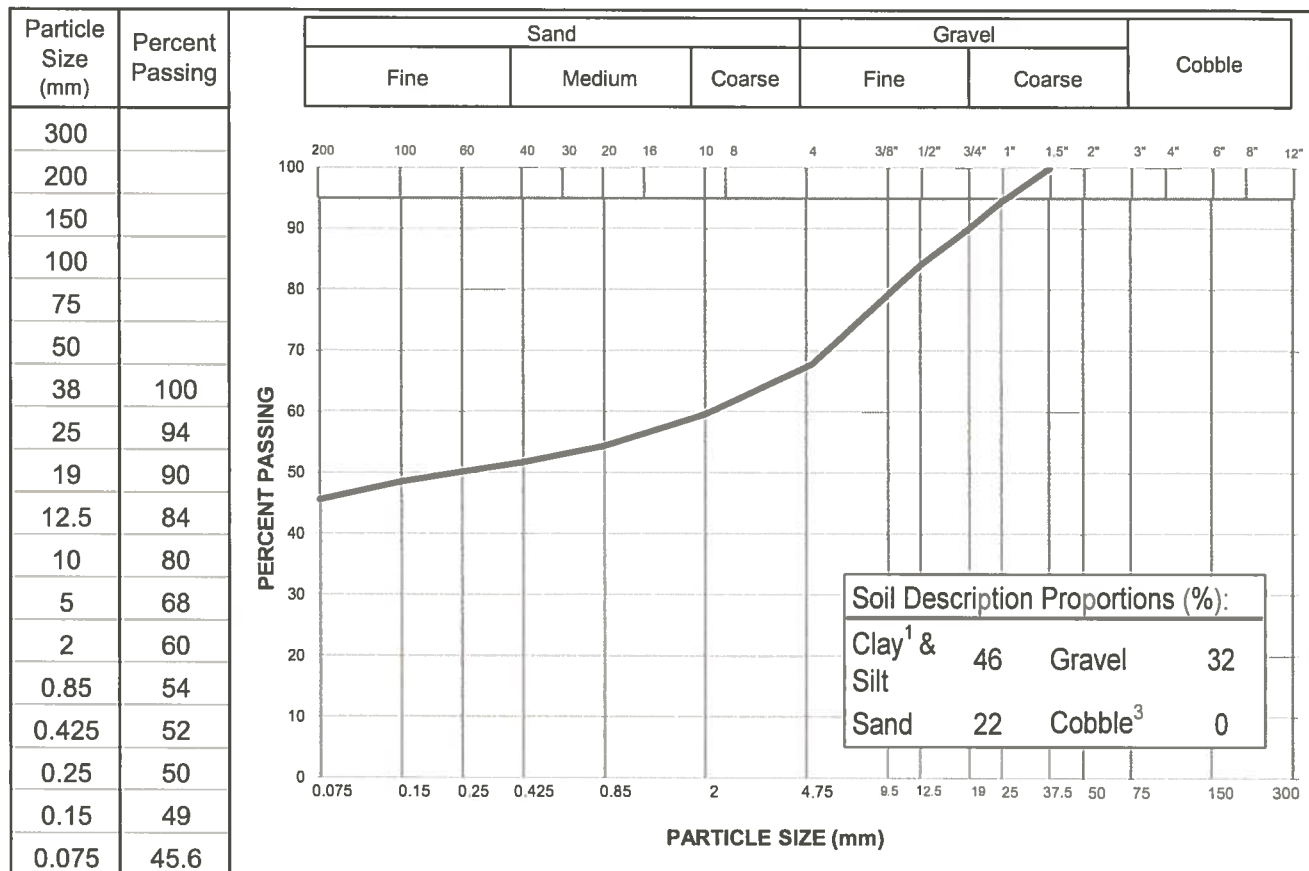
PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation
 Project No.: TRN.VHWY03212-01
 Site: Inuvik, NT
 Client: PWGSC
 Client Rep.: Yakob Woldeyesus
 Date Tested: May 5, 2021
 Soil Description²: GRAVEL and SILT - sandy

Sample No.: SA15
 Material Type: Embankment
 Sample Loc.: TP21-13
 Sample Depth: 0.5m
 Sampling Method: Grab
 Date Sampled: April 29, 2021
 Sampled By: AMM
 USC Classification: GM Cu: #N/A
 Cc: #N/A

Moisture Content: 14.6%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to Tt WM4400 description protocols
³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification:

Remarks:

Reviewed By:

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TETRA TECH

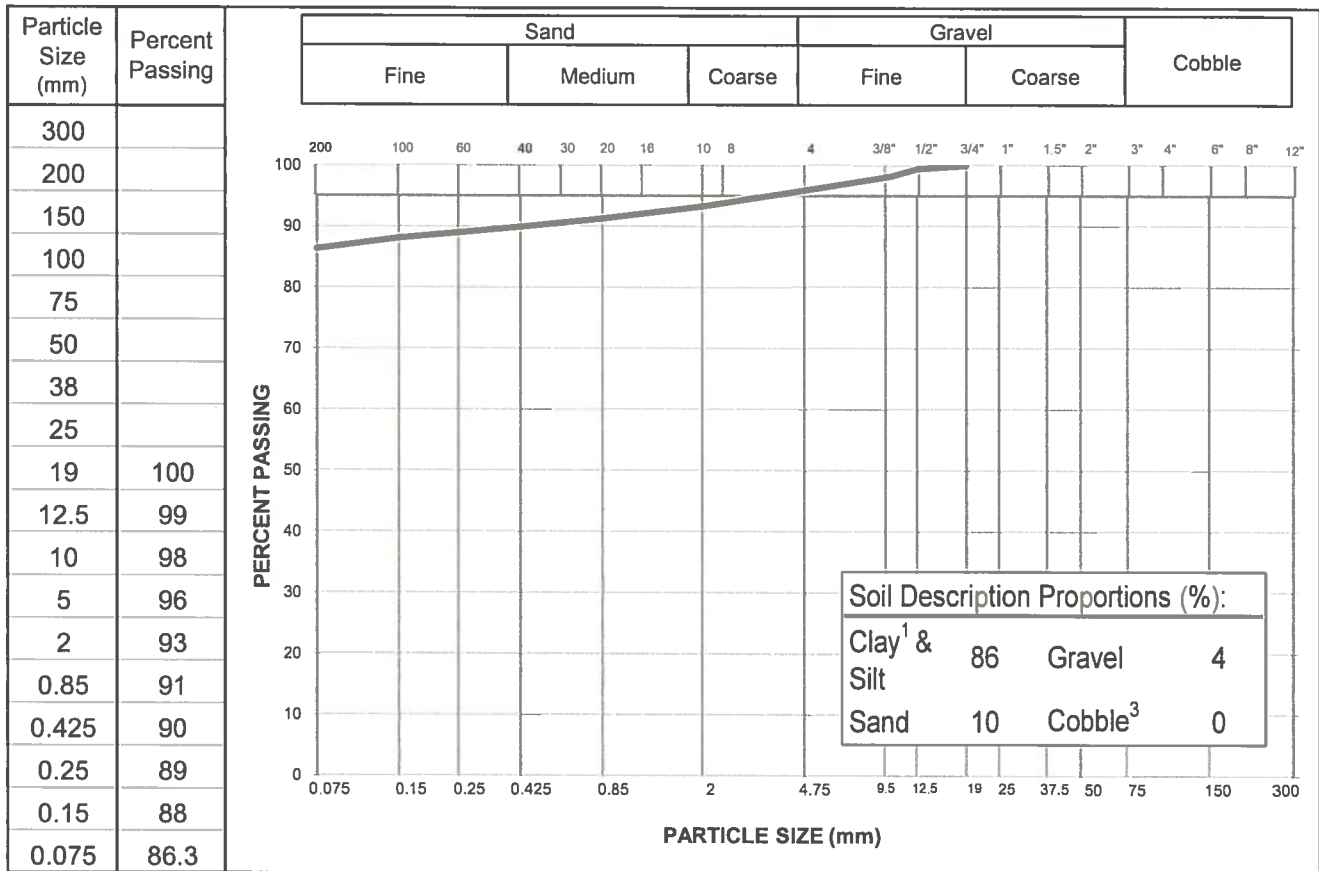
PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation
 Project No.: TRN.VHWY03212-01
 Site: Inuvik, NT
 Client: PWGSC
 Client Rep.: Yakob Woldeyesus
 Date Tested: May 5, 2021 By: BW
 Soil Description²: CLAY - trace sand, trace gravel

Sample No.: SA16
 Material Type: Embankment
 Sample Loc.: TP21-14
 Sample Depth: 0.4m
 Sampling Method: Grab
 Date Sampled: April 29, 2021
 Sampled By: AMM
 USC Classification: CI Cu: #N/A
 Cc: #N/A

Moisture Content: 20.6%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to Tt WM4400 description protocols
³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By:  C.E.T.

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ATTERBERG LIMITS TEST REPORT

ASTM D4318

Project: ISSF Road Rehabilitation

Sample Number: SA16

Project No: TRN.VHWY03212-01

Borehole Number: TP21-14

Client: PWGSC

Source: Embankment

Attention: Yakob Woldeyesus

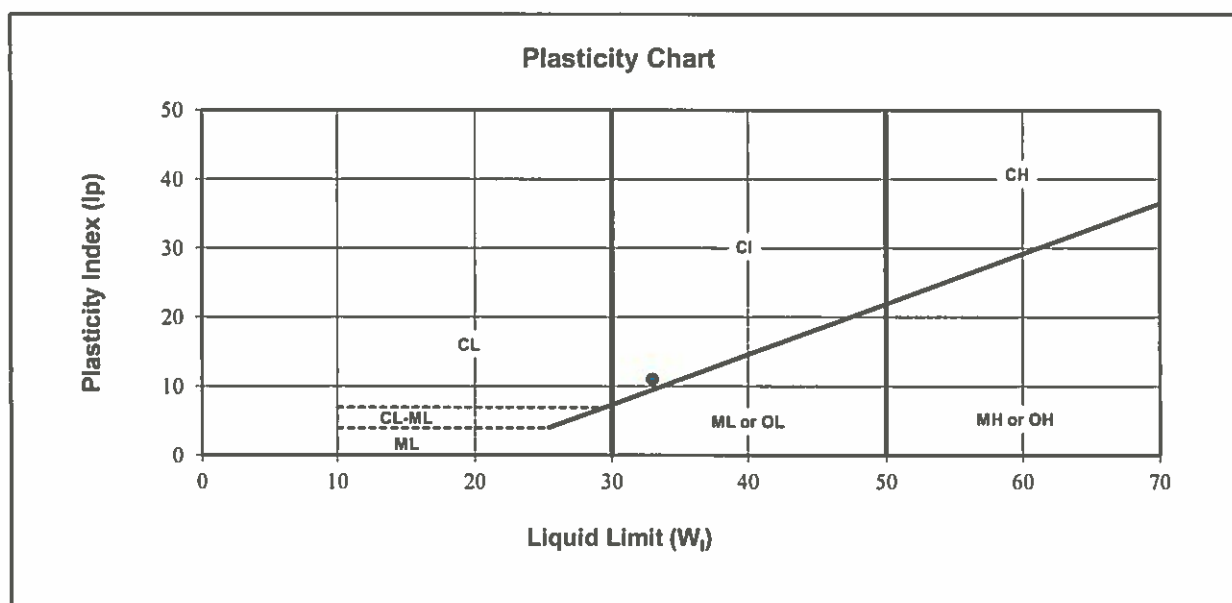
Sampled By: AMM Tested By: BW

Email: -

Date Sampled: April 29, 2021

Date Tested: May 5, 2021

Sample Description: CLAY - trace sand, trace gravel



Liquid Limit (W_L): 33

Natural Moisture (%): 20.6

Plastic Limit: 22

Soil Plasticity: Medium

Plasticity Index (I_p): 11

Mod.USCS Symbol: CI

Remarks:

Reviewed By:

[Signature]

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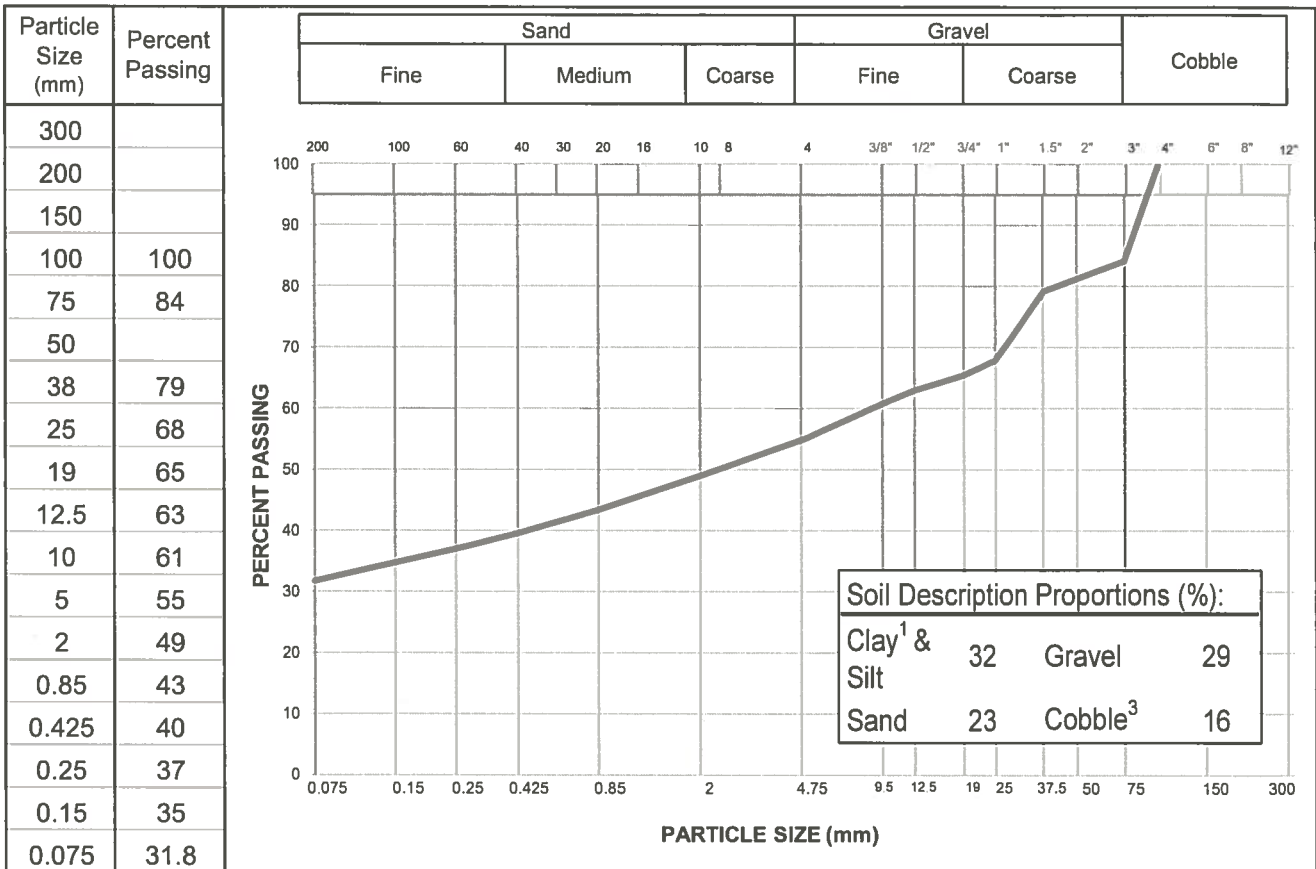


PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project:	ISSF Road Rehabilitation	Sample No.:	SA17
Project No.:	TRN.VHWY03212-01	Material Type:	Embankment
Site:	Inuvik, NT	Sample Loc.:	TP21-15
Client:	PWGSC	Sample Depth:	0.4m
Client Rep.:	Yakob Woldeyesus	Sampling Method:	Grab
Date Tested:	May 5, 2021	By:	BW
Date Tested:	May 5, 2021	Date Sampled:	April 29, 2021
Soil Description ² :	GRAVEL - silty, sandy, some cobble		Sampled By:
		USC Classification:	GM
		Cu:	#N/A
		Cc:	#N/A

Moisture Content: 15.7%



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to Tt WM4400 description protocols
³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: _____

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ATTERBERG LIMITS TEST REPORT

ASTM D4318

Project: ISSF Road Rehabilitation

Sample Number: SA17

Borehole Number: TP21-15

Project No: TRN.VHWY03212-01

Source: Embankment

Client: PWGSC

Sampled By: AMM Tested By: BW

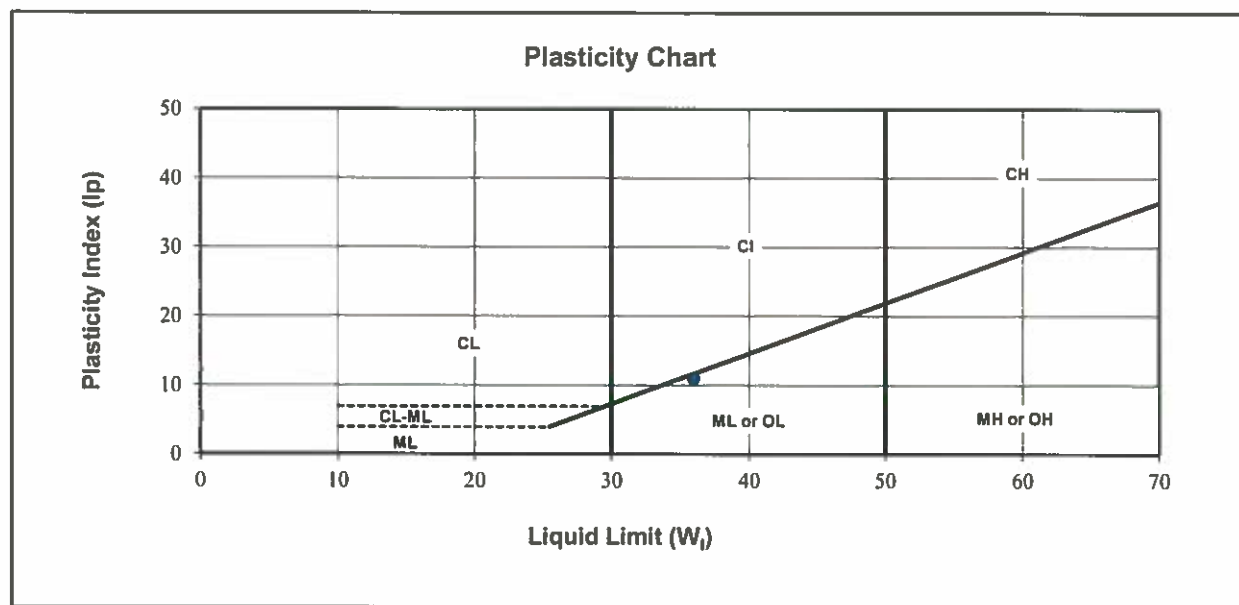
Attention: Yakob Woldeyesus

Date Sampled: April 29, 2021

Email: -

Date Tested: May 5, 2021

Sample Description: GRAVEL - silty, sandy, some cobble



Liquid Limit (W_L): 36

Natural Moisture (%): 15.7

Plastic Limit: 25

Soil Plasticity: Low

Plasticity Index (Ip): 11

Mod.USCS Symbol: ML

Remarks:

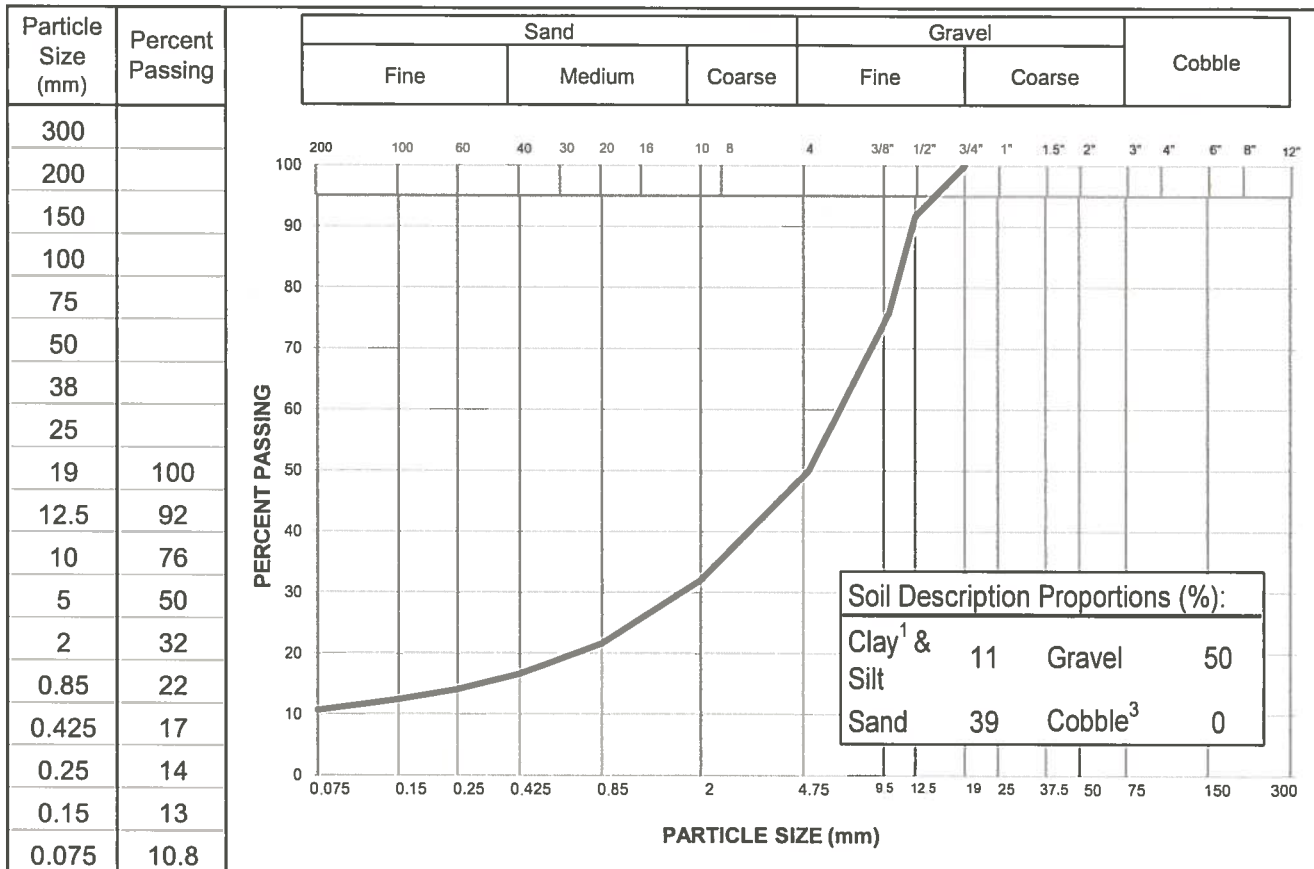
Reviewed By:  C.E.T.

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PARTICLE SIZE ANALYSIS REPORT

ASTM D7928 & C136

Project: ISSF Road Rehabilitation Sample No.: SA18
 Project No.: TRN.VHWY03212-01 Material Type: Surfacing Gravel
 Site: Inuvik, NT Sample Loc.: TP21-16
 Client: PWGSC Sample Depth: 0.1m
 Client Rep.: Yakob Woldeyesus Sampling Method: Grab
 Date Tested: May 5, 2021 By: BW Date Sampled: April 29, 2021
 Soil Description²: GRAVEL and SAND - some silt Sampled By: AMM
 USC Classification: GP Cu: #N/A
 Moisture Content: 3.5% Cc: #N/A



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to Tt WM4400 description protocols
³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By:  C.E.T.

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ATTERBERG LIMITS TEST REPORT

ASTM D4318

Project: ISSF Road Rehabilitation

Sample Number: SA18

Borehole Number: TP21-16

Project No: TRN.VHWY03212-01

Source: Surface Gravel

Client: PWGSC

Sampled By: AMM Tested By: BW

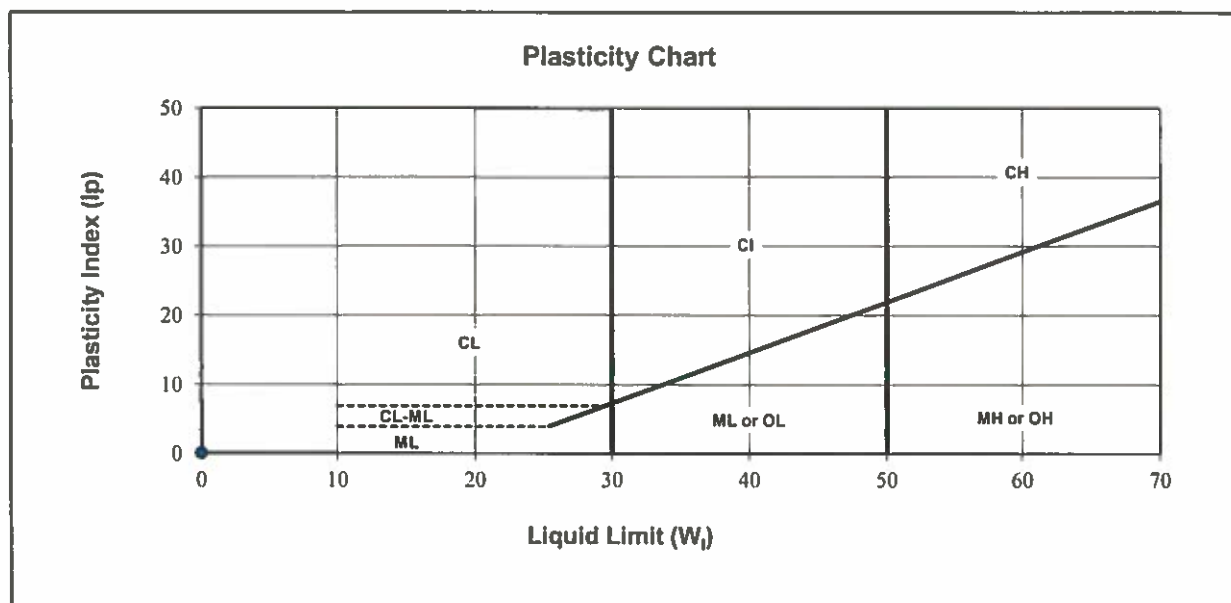
Attention: Yakob Woldeyesus

Date Sampled: April 29, 2021

Email: -

Date Tested: May 5, 2021

Sample Description: GRAVEL and SAND - some silt



Liquid Limit (W_p): 0

Natural Moisture (%): 3.5

Plastic Limit: NP

Soil Plasticity: Low

Plasticity Index (Ip): 0

Mod.USCS Symbol: NP

Remarks:

Reviewed By:  C.E.T.

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PARTICLE SIZE ANALYSIS REPORT

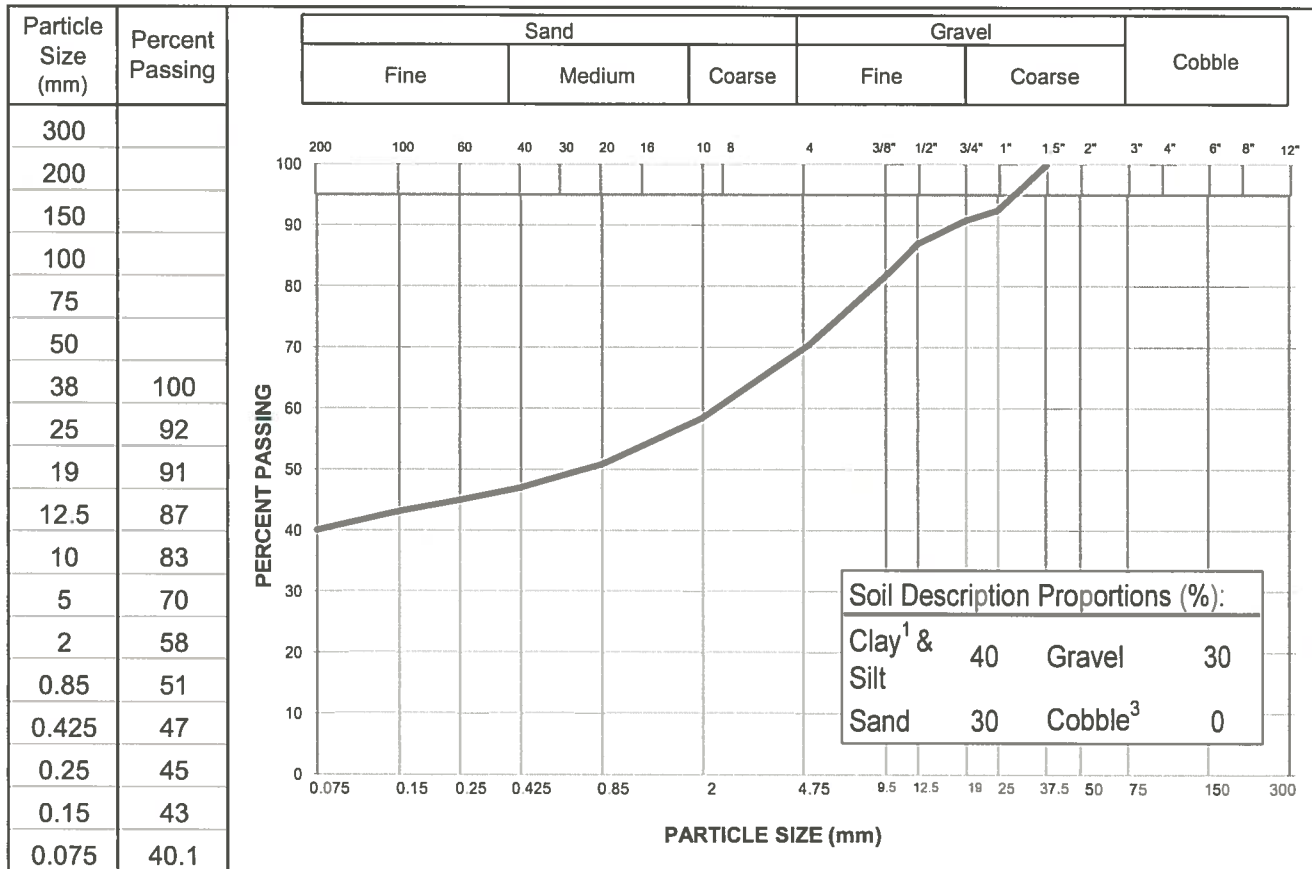
ASTM D7928 & C136

Project: ISSF Road Rehabilitation
 Project No.: TRN.VHWY03212-01
 Site: Inuvik, NT
 Client: PWGSC
 Client Rep.: Yakob Woldeyesus
 Date Tested: May 5, 2021 By: BW
 Soil Description²: GRAVEL and SAND and SILT

Sample No.: SA19
 Material Type: Embankment
 Sample Loc.: TP21-16
 Sample Depth: 0.4m
 Sampling Method: Grab
 Date Sampled: April 29, 2021
 Sampled By: AMM
 USC Classification: GC//SC Cu: #N/A
 Cc: #N/A

Moisture Content: 17.4%

Cc: #N/A



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

² The description is visually based & subject to Tt WM4400 description protocols

³ If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification:

Remarks:

Reviewed By:

C.E.T.

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MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

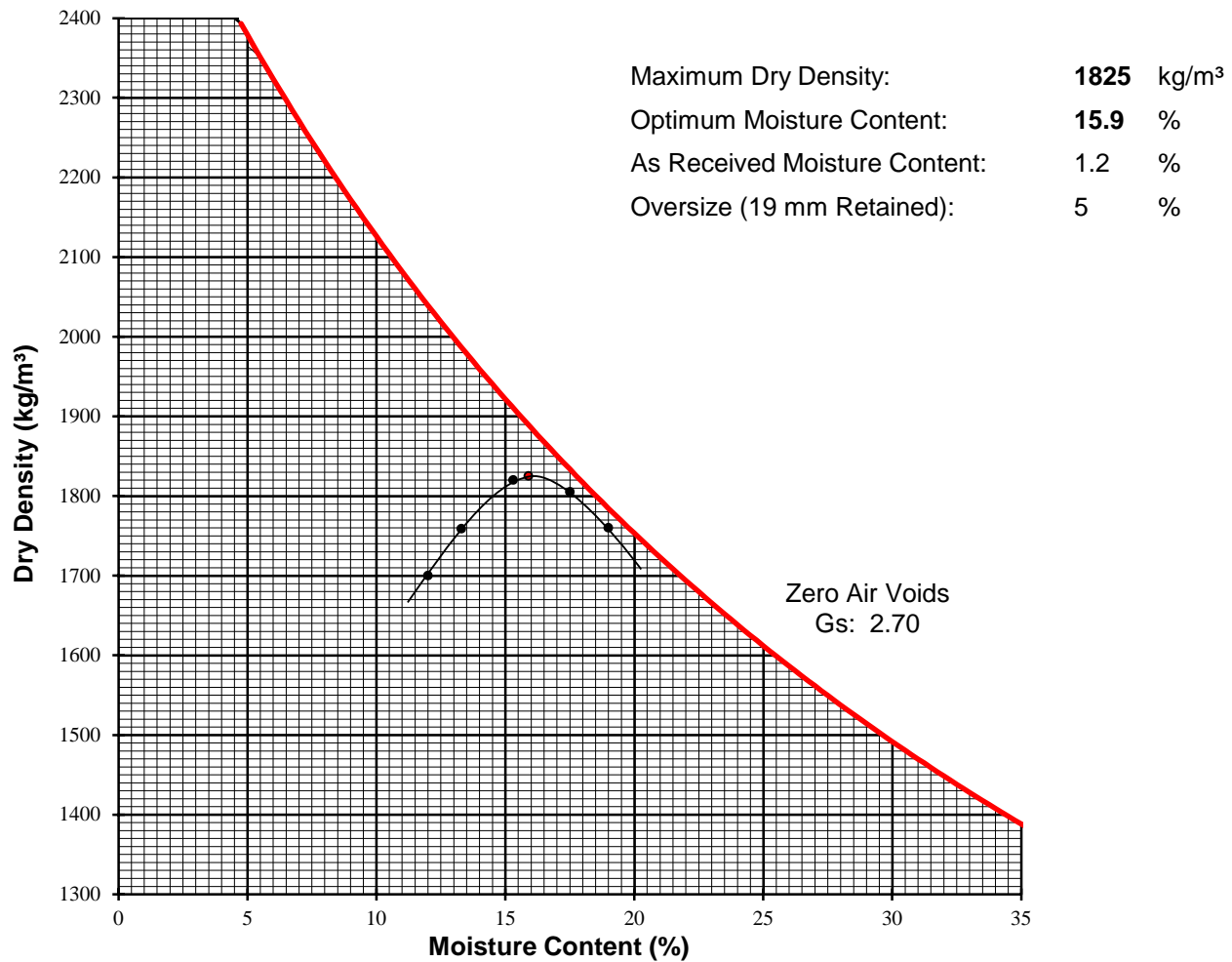
ASTM D698 (Standard Proctor)

Project: ISSF Road Rehabilitation
Project No.: TRN.VHWY03212-01
Client: Public Works & Government Services Canada
Attention: Yakob Woldeyesus
E-mail: _____
Source: Embankment Material - Composite sample

Sample No.: 1059
Sampled By: AMM
Date Received: May 20, 2021
Test Date: May 22, 2021
Test By: MA
Test Method: C (Manual)

Sample Location: _____

Sample Description: SILT, sandy, some gravel, grey



Remarks: _____

Reviewed By: IPR P.Eng.

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CALIFORNIA BEARING RATIO (CBR) TEST REPORT

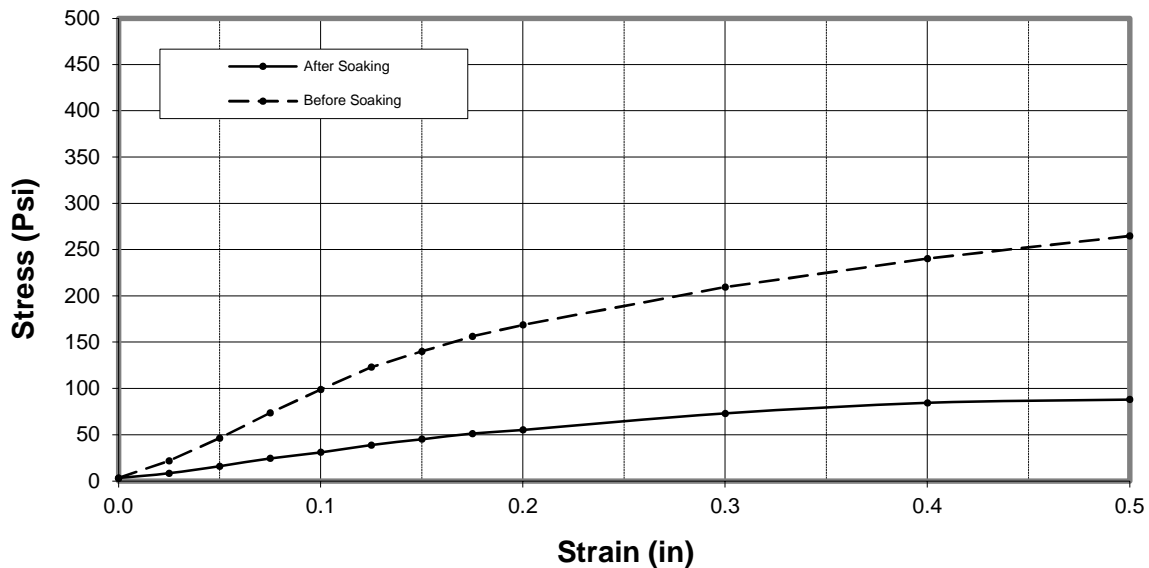
ASTM D1883

Project:	ISSF Road Rehabilitation	Sample No.:	1059
Client:	Public Works & Gov. Services Canada	CBR Specimen Density:	1625 kg/m ³
Project No.:	TRN.VHWY03212-01	CBR Specimen Compaction	89.0 %
Test Date:	May 22, 2021	Total Swell:	1.97 %
Soaking:	96.0 Hours	Surcharge Mass:	4.54 kg
Description:	USV, sandy, some gravel, grey	Optimum Moisture Content:	15.9 %
		Max. Dry Density:	1825 kg/m ³
		by (ASTM D698) Standard Proctor	

	Before Soaking	After Soaking	Corrected for Zero *
Bearing Ratio (0.1") =	9.9 %	3.1 %	Yes
Bearing Ratio (0.2") =	11.3 %	3.7 %	
Moisture Content =	16.4 %	23.8 %	
Moisture Content @ top 1" =	-	25.4 %	

* CBR corrected for zero point adjustment as per ASTM D1883, Fig. 2

Load-Penetration



Remarks: Source: Embankment Material - Composite sample.

10 Blows

Laboratory: Edmonton

Reviewed By:

IPR

P.Eng.

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CALIFORNIA BEARING RATIO (CBR) TEST REPORT

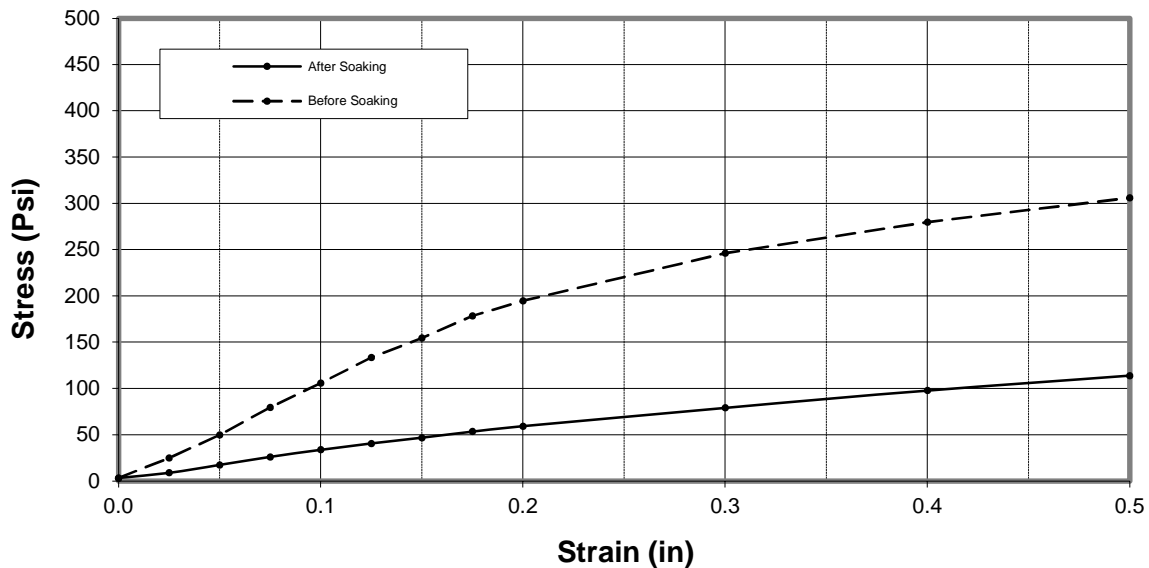
ASTM D1883

Project:	ISSF Road Rehabilitation	Sample No.:	1059
Client:	Public Works & Gov. Services Canada	CBR Specimen Density:	1793 kg/m ³
Project No.:	TRN.VHWY03212-01	CBR Specimen Compaction	98.2 %
Test Date:	May 22, 2021	Total Swell:	1.94 %
Soaking:	96.0 Hours	Surcharge Mass:	4.54 kg
Description:	USV, sandy, some gravel, grey	Optimum Moisture Content:	15.9 %
		Max. Dry Density:	1825 kg/m ³
		by (ASTM D698) Standard Proctor	

	Before Soaking	After Soaking	Corrected for Zero *
Bearing Ratio (0.1") =	10.6 %	3.4 %	Yes
Bearing Ratio (0.2") =	13.0 %	4.0 %	
Moisture Content =	16.4 %	23.4 %	
Moisture Content @ top 1" =	-	24.0 %	

* CBR corrected for zero point adjustment as per ASTM D1883, Fig. 2

Load-Penetration



Remarks: Source: Embankment Material - Composite sample.

25 Blows

Laboratory: Edmonton

Reviewed By: *IPR*

P.Eng.

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CALIFORNIA BEARING RATIO (CBR) TEST REPORT

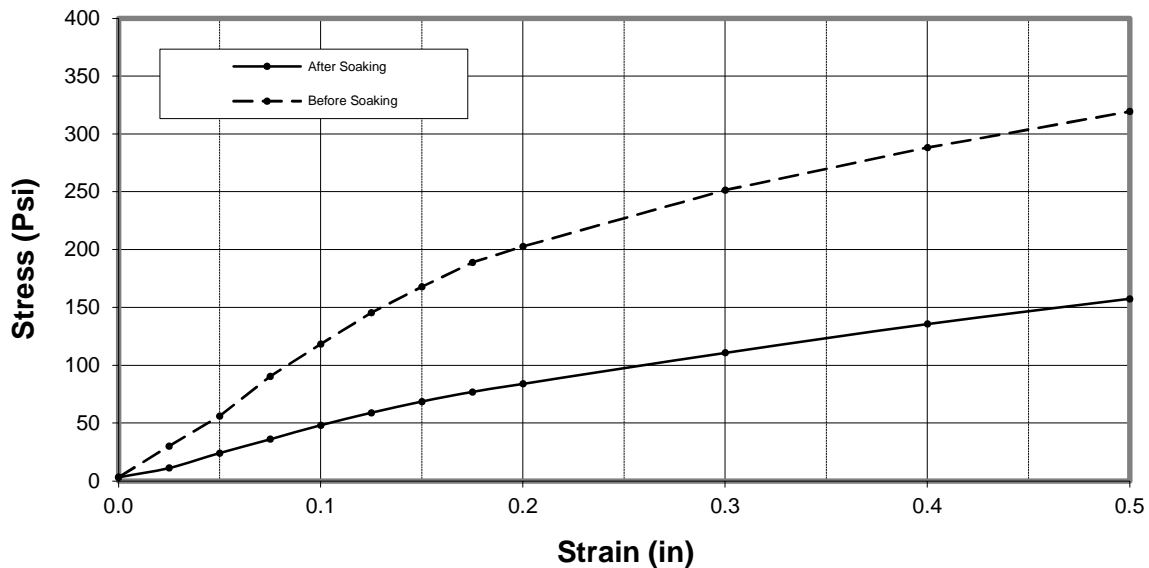
ASTM D1883

Project:	ISSF Road Rehabilitation	Sample No.:	1059
Client:	Public Works & Gov. Services Canada	CBR Specimen Density:	1830 kg/m ³
Project No.:	TRN.VHWY03212-01	CBR Specimen Compaction	100.3 %
Test Date:	May 22, 2021	Total Swell:	1.31 %
Soaking:	96.0 Hours	Surcharge Mass:	4.54 kg
Description:	USV, sandy, some gravel, grey	Optimum Moisture Content:	15.9 %
		Max. Dry Density:	1825 kg/m ³
		by (ASTM D698) Standard Proctor	

	Before Soaking	After Soaking	Corrected for Zero *
Bearing Ratio (0.1") =	11.8 %	4.8 %	Yes
Bearing Ratio (0.2") =	13.5 %	5.6 %	
Moisture Content =	16.4 %	19.0 %	
Moisture Content @ top 1" =	-	20.4 %	

* CBR corrected for zero point adjustment as per ASTM D1883, Fig. 2

Load-Penetration



Remarks: Source: Embankment Material - Composite sample.

56 Blows

Laboratory: Edmonton

Reviewed By: *IPR*

P.Eng.

Data presented hereon is for the sole use of the stipulated client. Tetra Tech is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of Tetra Tech. The testing services reported herein have been performed to recognized industry standards, unless noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, Tetra Tech will provide it upon written request.



APPENDIX B

TETRA TECH'S LIMITATIONS ON USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

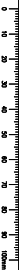
1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.



Section - APPENDICES

APPENDIX H – ISSF OLD BORROW SITE (TOWN PIT) – PIT PLAN



REAL PROPERTY SERVICE
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

USED FOR REVIEW

MEASUREMENTS, COORDINATES, ELEVATIONS, AND DISTANCES IN METRES UNLESS NOTED OTHERWISE. SURVEY BY GEOMATICS DEPARTMENT, UNIVERSITY OF GUELPH, MAY / OCT 2021.

Public Services and Procurement Canada	Services publics Approvisionnement
Natural Resources Canada	Ressources Canada



**VIK SATELLITE STATION
FACILITY ACCESS ROAD
REHABILITATION PROJECT
INUVIK, NT**

by/Approve par	by/Concept par	by/Design par	by/Manager/Approve par de Projets	by/Architectural et/le Directeur d'Ingénierie	by/Approve par
by/Approve par	by/Concept par	by/Design par	by/Manager/Approve par de Projets	by/Architectural et/le Directeur d'Ingénierie	by/Approve par

OLD BORROW SITE (TOWNSHIP PIT PLAN)

Sheet/feuille	350.001
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Section - APPENDICES

APPENDIX I – STA. 100+460 EXISTING SECURITY GATE - PHOTOGRAPHS

Date & Time: Sun, Jun 09, 2019, 16:47:44 MDT
Position: 8 N 577047 7695679
Altitude: 8m
Datum: WGS-84
Azimuth/Bearing: 040° N40E 0711mils (True)
Elevation Grade: -013%
Horizon Grade: -001%
Zoom: 1X
ISSF road



Date & Time: Sun, Jun 09, 2019, 16:47:50 MDT
Position: 8 N 577047 7695679
Altitude: 8m
Datum: WGS-84
Azimuth/Bearing: 048° N48E 0853mils (True)
Elevation Grade: -016%
Horizon Grade: -001%
Zoom: 1X
ISSF road



Date & Time: Tue, Jun 15, 2021, 09:57:15 MDT
Position: 8 N 559118 7579452 ($\pm 5.0\text{m}$)
Altitude: 50m ($\pm 3.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 296° N64W 5262mils True ($\pm 20^\circ$)
Elevation Grade: -021%
Horizon Grade: -001%
Zoom: 1.0X
ISSF 100 Intersection with old pit access



Date & Time: Mon, Jun 10, 2019, 09:04:21 MDT
Position: 8 N 559109 7579445
Altitude: 43m
Datum: WGS-84
Azimuth/Bearing: 019° N19E 0338mils (True)
Elevation Grade: -027%
Horizon Grade: +003%
Zoom: 1X
ISSF road drainage / ponding water





Section - APPENDICES

APPENDIX J – GNWT KM 251 QUARRY PIT - PHOTOGRAPHS

Note: Photographs taken on July 7, 2022, and on June 14, 2021, as noted following, and represent the conditions of the pit at those times. Site conditions are subject to change frequently and the contractor should satisfy themselves for the current conditions a time of tender.



Date: July 7, 2022



Date: July 7, 2022



Date: July 7, 2022



Date: July 7, 2022



Date: July 7, 2022



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Date: June 14, 2021



Section - APPENDICES

APPENDIX K – PHOTOS: ISSF ROAD (ENTRANCE TO NORTH LEG TERMINUS, STA 100+015 TO 102+771)

Note: Photographs were taken between 13th - 15th June 2021 and represent the conditions at this time. Site conditions are subject to change frequently and the contractor should satisfy themselves for the current conditions a time of tender.

Date & Time: Mon, Jun 14, 2021, 19:41:01 MDT
Position: 8 N 559122 7579478 ($\pm 5.0\text{m}$)
Altitude: 55m ($\pm 6.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 345° N15W 6133mils True ($\pm 35^\circ$)
Elevation Grade: +018%
Horizon Grade: -007%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:41:58 MDT
Position: 8 N 559353 7579661 ($\pm 5.0\text{m}$)
Altitude: 57m ($\pm 3.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 344° N16W 6116mils True ($\pm 35^\circ$)
Elevation Grade: +017%
Horizon Grade: -001%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:42:16 MDT
Position: 8 N 559438 7579742 ($\pm 5.0\text{m}$)
Altitude: 61m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 339° N21W 6027mils True ($\pm 35^\circ$)
Elevation Grade: +015%
Horizon Grade: -002%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:42:35 MDT
Position: 8 N 559438 7579856 ($\pm 5.0\text{m}$)
Altitude: 69m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 325° N85W 5778mils True ($\pm 35^\circ$)
Elevation Grade: +012%
Horizon Grade: +005%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:42:49 MDT
Position: 8 N 559426 7579938 ($\pm 5.0\text{m}$)
Altitude: 68m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 343° N17W 6098mils True ($\pm 35^\circ$)
Elevation Grade: +015%
Horizon Grade: -001%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:43:03 MDT
Position: 8 N 559445 7580030 ($\pm 5.0\text{m}$)
Altitude: 74m ($\pm 6.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 345° N15W 6133mils True ($\pm 35^\circ$)
Elevation Grade: +017%
Horizon Grade: +004%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:43:15 MDT
Position: 8 N 559451 7580096 ($\pm 5.0\text{m}$)
Altitude: 74m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 338° N22W 6009mils True ($\pm 35^\circ$)
Elevation Grade: +009%
Horizon Grade: +002%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:43:15 MDT
Position: 8 N 559451 7580096 ($\pm 5.0\text{m}$)
Altitude: 74m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 338° N22W 6009mils True ($\pm 35^\circ$)
Elevation Grade: +009%
Horizon Grade: +002%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:44:01 MDT
Position: 8 N 559427 7580372 ($\pm 5.0\text{m}$)
Altitude: 68m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 001° N01E 0018mils True ($\pm 35^\circ$)
Elevation Grade: +024%
Horizon Grade: +003%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:44:01 MDT
Position: 8 N 559427 7580372 ($\pm 5.0\text{m}$)
Altitude: 68m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 001° N01E 0018mils True ($\pm 35^\circ$)
Elevation Grade: +024%
Horizon Grade: +003%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:44:28 MDT
Position: 8 N 559497 7580550 ($\pm 5.0\text{m}$)
Altitude: 78m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 347° N13W 6169mils True ($\pm 35^\circ$)
Elevation Grade: +012%
Horizon Grade: -003%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:44:44 MDT
Position: 8 N 559474 7580669 ($\pm 5.0\text{m}$)
Altitude: 80m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 322° N88W 5724mils True ($\pm 35^\circ$)
Elevation Grade: +014%
Horizon Grade: -004%
Zoom: 1.0X
ISSF Road Overview Video



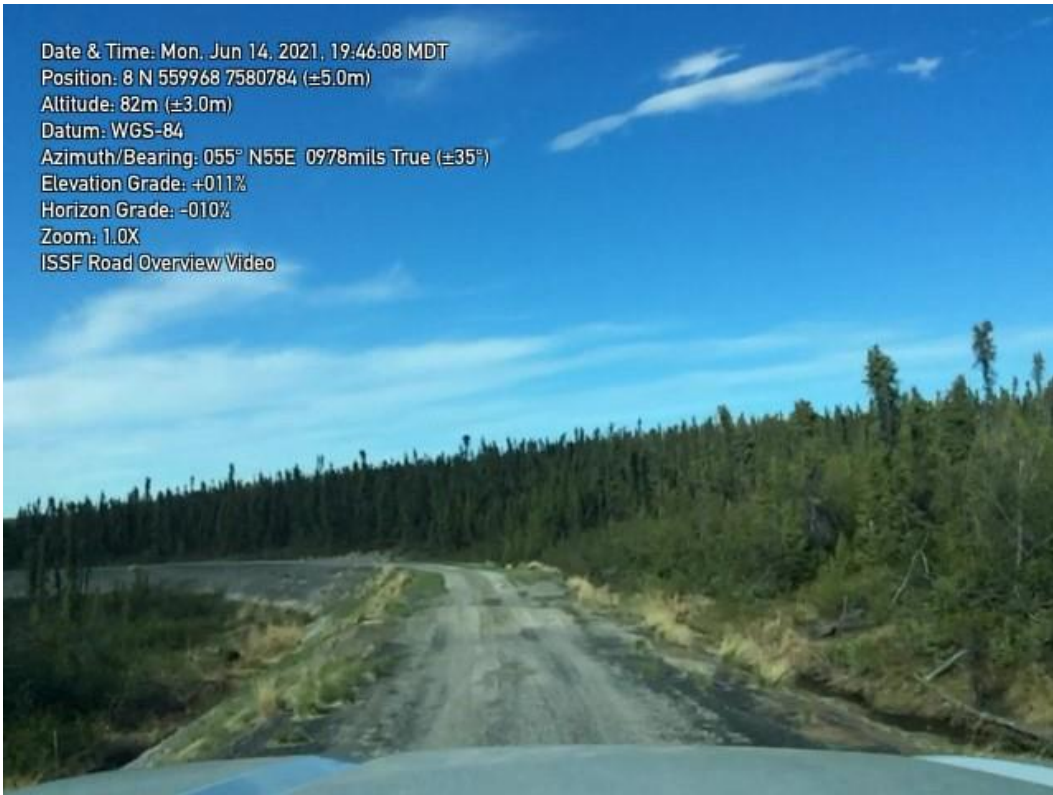
Date & Time: Mon, Jun 14, 2021, 19:45:09 MDT
Position: 8 N 559547 7580775 ($\pm 5.0\text{m}$)
Altitude: 83m ($\pm 3.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 015° N15E 0267mils True ($\pm 35^\circ$)
Elevation Grade: +012%
Horizon Grade: +003%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:45:30 MDT
Position: 8 N 559717 7580740 ($\pm 5.0\text{m}$)
Altitude: 79m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 083° N83E 1476mils True ($\pm 35^\circ$)
Elevation Grade: +013%
Horizon Grade: -005%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:46:08 MDT
Position: 8 N 559968 7580784 ($\pm 5.0\text{m}$)
Altitude: 82m ($\pm 3.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 055° N55E 0978mils True ($\pm 35^\circ$)
Elevation Grade: +011%
Horizon Grade: -010%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:46:36 MDT
Position: 8 N 559969 7580942 ($\pm 5.0\text{m}$)
Altitude: 75m ($\pm 4.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 326° N34W 5796mils True ($\pm 35^\circ$)
Elevation Grade: +009%
Horizon Grade: -002%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 19:46:45 MDT
Position: 8 N 559911 7580984 ($\pm 5.0\text{m}$)
Altitude: 74m ($\pm 3.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 302° N58W 5369mils True ($\pm 35^\circ$)
Elevation Grade: +011%
Horizon Grade: -000%
Zoom: 1.0X
ISSF Road Overview Video



Date & Time: Mon, Jun 14, 2021, 15:35:28 MDT
Position: 8 N 559848 7581002 ($\pm 5.0\text{m}$)
Altitude: 77m ($\pm 3.0\text{m}$)
Datum: WGS-84
Azimuth/Bearing: 145° S35E 2578mils True ($\pm 20^\circ$)
Elevation Grade: -019%
Horizon Grade: -001%
Zoom: 1.0X
ISSF 100 Turnaround 15 m dia.



