

Supplementary Project Specifications

Bella Coola Airport – Airfield Pavement Rehabilitation Project

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PART 1 – GENERAL

1.1 Related Sections

- .1 Section 01 35 13.13 – Special Project Procedures for Airport Facilities
- .2 All other Sections

1.2 Scope of Work

- .1 The Work included in this Contract comprises of the Airfield Pavement Rehabilitation Project and related works at the Bella Coola Airport.
- .2 General construction works to be undertaken includes, but is not limited to:
 - Applying for permits, completing survey, site preparation, supply, install, and maintain safety barricades, quality control, etc.
 - Prepare and submit project schedule, shop drawings, project submittals.
 - Continuous site cleaning and sweeping.
 - While airside, protect all aircraft and equipment, and keep site clear of Foreign Object Debris (FOD).
- .3 The main scope of work includes:

Airfield Pavement Rehabilitation – Runway 05-23, Taxiway A, Apron I

- PROVISIONAL – Supply and apply Geosynthetic Reinforcement Layer (Tensar GlasGrid 8511 TF) on existing pavement surface.
- New asphalt pavement overlay
 - Place 75 mm HMAC Surface course (BC MoTI Class 1 Medium)
 - Transition ramps to match existing pavement grades.
- Supply and place pavement line paintings
- Restoration of all pavement edges and work areas with screened surface topsoil and hydroseed.

1.3 List of Drawings

- .1
 - C001 COVER PAGE
 - C010 SITE PLAN
 - C011 CONSTRUCTION OPERATIONS PLAN
 - C020 EXISTING CONDITIONS AND REMOVALS PLAN
 - C031 GRADING PLAN AND PROFILES – SHEET 1 OF 6
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 - C062 TYPICAL CIVIL DETAILS – SHEET 2 OF 2

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

- .1 Access and Egress
- .2 Use of Sites and Facilities
- .3 Alterations, Additions, or Repairs to Existing Structures
- .4 Existing Services
- .5 Special Requirements
- .6 Security
- .7 No smoking policy

1.2 Related Sections

- .1 Section 01 15 50 - Special Provisions
- .2 Section 01 33 00 – Submittal Procedures
- .3 Section 01 35 13 – Special Project Procedures for Airport Facilities
- .4 Section 01 35 43 – Environmental Procedures
- .5 Section 01 51 00 – Temporary Utilities
- .6 Section 01 52 00 – Construction Facilities
- .7 Section 01 74 00 – Cleaning

1.3 Access and Egress

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including ramps, laydown areas, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.4 Use of Site Facilities

- .1 Execute work with least possible interference or disturbance to normal use of premises. Arrange with Central Coastal Regional District to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Contractor is responsible for providing sanitary facilities for use by Contractor's personnel. Contractor shall keep facilities clean.
- .6 Closures: protect work temporarily until permanent enclosures are completed.

1.5 Alterations, Additions, or Repairs to Existing Structures

- .1 Execute work with least possible interference or disturbance to airport operations and tenants and normal use of premises. Advise with Central Coastal Regional District at the commencement of each phase of work to facilitate execution of work.

1.6 Existing Services

- .1 Notify, Central Coastal Regional District and utility companies of intended interruption of services and obtain required permission, if required.
- .2 Where Work involves breaking into or connecting to existing services, give Central Coastal Regional District 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .3 Provide right of way to airport personnel and vehicular traffic.
- .4 Provide construction barriers in accordance with Contract Documents or equivalent

1.7 Special Requirements

- .1 Submit schedule in accordance with Section 01 33 00 – Submittal Procedures
- .2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic, and security regulations, and the strict NO SMOKING policy
- .3 Keep within limits of work and avenues of ingress and egress.
- .4 Contractor laydown areas to the north and south of the airport as subject to high water levels during the spring freshet and these areas need to be avoided during that time.

1.8 Security

- .1 Contractor is responsible for providing a secure work environment

1.9 No Smoking Policy

- .1 The Central Coastal Regional District has designated the Airside area and all buildings as NO SMOKING, except in designated areas. Smoking in vehicles on the Airside will not be permitted. This policy applies equally to all staff and Contractor's employees and subcontractors. Contractors are required to bring this policy to the attention of all their employees and subcontractors who will be required to work on the Airside area and all buildings and rigidly enforce this policy.

END OF SECTION

PART 1 - GENERAL

- .1 Payments will be made on the basis of the lump sum prices bid and the unit prices bid in the Tender, and in accordance with the General Conditions.
- .2 The prices bid for various items of Work, unless specifically noted otherwise, shall include the supply of all labour, PLANT, MATERIAL and PRODUCT equipment necessary to construct THE WORK in accordance with the specifications.
- .3 The prices bid for supply and installation shall be full compensation for supplying, hauling, installing, cleaning, testing, and placing in service together with all other Work subsidiary and incidental thereto for which separate payment is not provided elsewhere.
- .4 Where the Tender shows separate items for supply and installation, the unit prices or lump sum prices bid for supply shall include supplying, delivering, loading, unloading and all allowances for handling, storage, breakage and waste. Payment will be made only for MATERIAL actually installed in THE WORK.
- .5 The method of measurement of the quantities for payment and the basis for payment will be in accordance with the following items of this section or as detailed in the various specifications contained in this document. All measurement shall be done by the CONTRACTOR using generally accepted field survey methods. Stationing interval for volume calculations shall not exceed 10 m.
- .6 Progress Payment for supply-only items shall be made only for MATERIAL and PRODUCT on the WORKSITE and in the CONTRACTOR'S care, and shall then become the Property of the Airport.
- .7 For each Lump Sum item in the Schedule of Breakdown Prices, the ENGINEER will, in cooperation with the CONTRACTOR, estimate the percentage of the item completed at the end of the payment period.
- .8 Other materials on site, whether existing structures, vegetation, topsoil, gravel, sand or other excavated or piled materials, are the property of the Airport or the land on which THE WORK is located. Only those materials specifically noted in the specification or on drawings as belonging to the CONTRACTOR shall become the CONTRACTOR'S property. For the purpose of this contract, any materials called for OFF-SITE disposal belong to the Contractor. On-site disposal shall imply the materials belong to the Airport and that disposal shall be in designated areas on the Airport property.
- .9 Where there are excess excavated materials, unsuitable materials excavated or materials of any kind that are excavated but not used in THE WORK, such materials are not the property of the CONTRACTOR unless authorized in writing by the ENGINEER or specified to be disposed of by the CONTRACTOR.

PART 2 – PROVISIONAL WORK

- .1 Where specific items of Work may be required during the course of construction, but the exact requirements of those items of Work will depend on ground conditions or other uncertain factors encountered, such items are shown in the Schedule of Unit Prices as Provisional Items. The quantities may vary significantly, or the item may not be used at all, at the sole discretion of the Owner. The Tenderer shall price these items accordingly and shall not claim any anticipated profit loss or increased overhead, in the event that any or all of these items is deleted, or the quantities are significantly altered. These items have been clearly noted as PROVISIONAL within the Schedule of Unit Prices.

PART 3 – QUALITY CONTROL TESTING

- .1 The provision of Quality Control Testing including associated laboratory testing, reporting and incidentals in accordance with Section 01 45 00 – Quality Control, and the applicable Contract Drawings and Specifications shall be considered incidental to the work of each unit price bid item.
- .2 The Contractor shall include in each unit price bid item costs to complete applicable materials testing and geotechnical supervision by a Professional Engineer licensed to practice in the Province of British Columbia.
- .3 Minimum testing frequencies in accordance with the Contract Drawings and Specifications.

PART 4 – SPECIAL PROVISIONS & BASIS FOR MEASUREMENT AND PAYMENT

- .1 The following sections are intended to provide supplemental detail to the contract items listed in the Price Schedule(s), the associated technical specifications, and the Contract Drawings. All information presented herein shall be considered as a whole. The Contractor is advised that not all items within the Price Schedule(s) may have an associated Special Provision.

1.1 Civil Mobilization and Demobilization (Lump Sum)

- .1 Mobilization and demobilization shall include the CONTRACTOR'S costs of mobilization at the beginning of the project; and the costs of demobilization at the end of the project.
- .2 Included in mobilization are such items as permits, moving personnel, materials and equipment to the site, setting up temporary facilities, floodlighting, and all preparation for performing THE WORK. This includes the setup, take down, and restoration of the Contractor's Yard/Staging area and any other temporary construction facilities.
- .3 Included in demobilization are the removal of personnel, materials and equipment; and restoration/cleanup of the site and the WORK.
- .4 The work under this item shall include costs associated with the insurance and bond requirements as required by the Central Coastal Regional District.
- .5 The work under this item shall include costs associated with the preparation of a project specific Health and Safety Plan which is to be provided to the Contract Administrator at the Pre-Construction Meeting.
- .6 The work under this item shall include all costs associated with the provision, and routine cleaning, of site privies in accordance with the applicable Employment Standards Act. The air terminal building may not be used by construction personnel.
- .7 The Contractor shall include in this item an allowance to prepare stockpile areas and disposal areas for unsuitable and excess material as may be required by the Contractor.
- .8 The work under this item shall include the construction of temporary construction access roads/temporary culverts as may be required to facilitate construction. Construction shall include clearing and grubbing, excavation/grading and placement of granular material as may be required by the Contractor. The temporary construction access roads shall be graded and compacted to provide positive drainage and shall be watered as required to provide dust control.
- .9 The Contractor to maintain and repair any haul routes/roads to their original condition within the project limits. The Contractor is advised to make their own determination of the quality of the public roadways for this project. No separate payment will be made for the restoration of these roadways/haul routes. At the end of the project, all disturbed areas shall be left in neat condition.
- .10 The Work under this item shall include without limitation, the supply, servicing, maintenance, removal, and restoration to existing conditions or better at the end of the project – of separate Site Offices for the Resident Engineer and Contractor.
- .11 Payment shall be made at the lump sum bid prorated based on the progress of the Work. Payment shall be full compensation for all related Work.

Pre-Construction Layout and Surveying

- .1 The work under this item shall be included under Civil Mobilization and Demobilization, and include, without limitation, all surveying work identified below.
- .2 Coordinate system established as:
 - a) UTM with NAD83 datum, Zone 9, Meter; CSRS
 - b) Short code in AutoCAD/Civil3D drawing settings: CSRS.UTM-9N
- .3 GPS survey is permitted for the Pre-Construction Survey. Where benchmarks are used, the following are established:

Point	Northing (m)	Easting (m)	Elevation (m)	Description
2	5806895.124	663971.804	35.003	FIP
3	5806574.707	663173.720	32.163	FCIP
2000	5806841.358	664165.283	35.662	BASE-SPK

- .4 Survey all existing and future pavement centreline and edges within defined work area at maximum 10 m intervals.
- .5 Survey all future pavement paint markings within defined work area.

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements and procedures for the Contractor to submit shop drawings, product data, samples, and mock-ups to the Engineer/Contract Administrator

1.2 Administration

- .1 Submit to the Engineer/Contract Administrator submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Any delay in submission is not considered sufficient reason for extension of contract schedule and no claim for extension by reason of such default is permitted
- .2 The Contractor is not to proceed with the Work associated with a submittal until the Engineer/Contract Administrator has completed their review
- .3 The Contractor shall present shop drawings, product data, samples and mock-ups in International System of Units (SI) metric units.
- .4 The Contractor shall review submittals prior to the submission to the Engineer/Contract Administrator. Submittals not stamped, signed, dated, and identified as to specific to this project will be returned without being examined and will be considered rejected
- .5 The Contractor shall ensure submittals are in electronic form. Facsimile or hand written submittals are not acceptable
- .6 The Contractor shall notify the Engineer/Contract Administrator, in writing at the time of submission, identifying deviations from the requirements outlined in the Contract Documents complete with justifications for deviation.
- .7 The Contractor's responsibility for errors and omissions in submission are not relieved by the review by the Engineer/Contract Administrator
- .8 The Contractor's responsibility for deviations in submission from the requirements in the Contract Documents are not relieved by the review by the Engineer/Contract Administrator

1.3 Shop Drawings and Product Data

- .1 Shop drawings are defined as drawings, diagrams, illustrations, schedules, performance charts, product brochures and any other data which are to be provided by the Contractor to illustrate and demonstrate a portion of the work
- .2 The Contractor shall submit shop drawings sealed and signed by a qualified professional engineer licensed to practice engineering in the Province of British Columbia.
- .3 The Contractor shall indicate materials, methods of construction, diagrams, connections, explanatory notes and other information necessary to complete the work.
- .4 The Contractor shall allow seven (7) days for the Engineer/Contract Administrator for each submittal
- .5 If a submittal results in a change in the Contract Price, the Contractor shall indicate to the Engineer/Contract Administrator prior to proceeding with the Work
- .6 All submittals shall contain the following information:
 - .1 Date
 - .2 Project title and number
 - .3 Contractor's name and address

- .4 Identification and quantity of each shop drawings, product data and samples
- .5 Name and Address of subcontractors, suppliers and/or manufacturers
- .6 Contractor's stamp, signed by the Contractor's authorized representative certifying the approval of submissions, complete with the verification of field measurements and compliance with the Contract Documents.
- .7 Any other pertinent data
- .7 Following the Engineer/Contract Administrator's review, the Contractor shall distribute copies
- .8 Contractor to submit electronic copy of shop drawings for each requirement identified in the specifications and as the Engineer/Contract Administrator requests
- .9 The Contractor shall submit electronic copy of product data sheets or brochures for requirements requested in specification and as requested by the Consultant where shop drawings will not be prepared due to standardized manufacture of product
- .10 Following the review by the Engineer/Contract Administrator and in the event no errors or omissions are discovered or only minor corrections are made, the work may proceed once approval has been given. If shop drawings are rejected or returned, the Contractor shall resubmit corrected shop drawings for approval

1.4 Samples

- .1 The Contractor shall submit for review samples in duplicate as requested in respective specifications. The Contractor shall label samples with origin and intended use.
- .2 The cost of delivering the samples to the Engineer/Contract Administrator shall be borne by the Contractor
- .3 The Contractor shall notify the Engineer/Contract Administrator in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Adjustments made on samples by the Engineer/Contract Administrator are not intended to change the Contract Price. If adjustments affect value of Work, the Contractor shall state such in writing to the Engineer/Contract Administrator prior to proceeding with Work
- .5 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified

1.5 Certificates and Transcripts

- .1 Immediately after award of Contract, the Contractor shall submit Workers' Compensation Board status; Certificate of insurance, proof of valid Central Coastal Regional District business licenses for the general contractor and named sub-contractors; construction schedule; company safety plan for the work being undertaken including COVID-19 safe work considerations.

1.6 Measurement for Payment

- .1 No separate payment will be made for submittals. All costs related to submissions are incidental to the Work.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

- .1 General protection and safety
- .2 Movement of equipment and personnel
- .3 Operational restrictions and constraints
- .4 Construction zones near runways and taxiways
- .5 Unserviceable areas
- .6 Trenching requirements and permits
- .7 Airport Facilities
- .8 Dust control
- .9 No smoking policy
- .10 Measurement Procedures

1.2 Related Sections

- .1 Section 01 14 00 – Work Restrictions
- .2 Section 01 15 50 - Special Provisions
- .3 Section 01 35 43 – Environmental Procedures
- .4 Section 01 51 00 – Temporary Utilities
- .5 Section 01 52 00 – Construction Facilities
- .6 Section 01 74 00 – Cleaning

1.3 General Protection

- .1 The Contractor shall not disrupt Airport business, except as required to complete the work. The contractor shall advise each airport business with expected closures (Runway, Taxiway Apron Unserviceable) 2 weeks in advance of the closure.
- .2 The Contractor shall provide temporary protection for safe handling of public, personnel, pedestrians, and vehicular traffic. Unless otherwise directed, comply with Section 01 51 00 - Temporary Utilities and 01 5200 - Construction Facilities.

1.4 Movement of Equipment and Personnel

- .1 Personal vehicles of Contractor's, subcontractors' and suppliers' employees shall be parked in Contractor's yard or other designated groundside area(s).
- .2 In areas of Airport not closed to aircraft traffic:
 - .1 The Contractor shall obtain approval from Central Coastal Regional District on scheduling of Work.
 - .2 The Contractor shall control movements of equipment and personnel as directed by the Central Coastal Regional District.
- .3 Signals from Central Coastal Regional District are to be obeyed instantly.
- .4 Authorization from Airport Operations must be obtained prior to any vehicle or personnel entering taxiways, runways or adjacent areas within 12.5 meters of taxiway centerlines and 40.0 meters of runway centerlines, in the event the facility is still operational. Contractor can only enter the areas once the facilities have been NOTAM closed, or are under escort by Airport Personnel.
- .5 In order to operate a radio at the Airport, a "Restricted Radio Telephone Operator's Certificate" must be obtained from Industry Canada.

1.5 Operational Restrictions and Constraints

- .1 The Contractor shall comply with operational, safety and security, and other applicable requirements, throughout execution of the Work in close proximity to runways and taxiways, including but not limited to the following:
 - .1 The integrity of electronic and visual navigational aids associated with live aviation activities on Airside must be maintained for aircraft operations, which take precedence over construction operations.
 - .2 Operational restrictions will affect the scheduling of the construction Work. The construction activities which may interfere with operations on existing runways, taxiways and aprons must be scheduled during periods when these operating surfaces are not in service.
 - .3 Physical and visual impediments to runway/taxiway/apron operations must be avoided when the maneuvering surfaces are in service. Physical intrusions, such as backhoes, scrapers, trucks, bulldozers, stockpiled materials, etc. must comply with the Airport zoning requirements in both horizontal and vertical directions. In particular, excavated surplus overburden material that is stored on site must be placed in areas, and to heights, identified in the Contract documents or as directed. Any unanticipated violations of zoning found unavoidable during the course of the Work, and not specifically addressed in the Contract documents, must be coordinated with Airport operations a minimum of ten (10) Business Days in advance of such Work.
 - .4 Buried power, communication and control cables, and other underground structures and services in the vicinity of the construction areas are to be identified, protected, and maintained. Contractor is responsible for locating these utilities prior to construction.
 - .5 Emergency Response Services mobility must be preserved at all times. Operating routes must be reviewed by the Central Coastal Regional District to ensure that access is maintained. Alternative and approved routes are to be established if new construction is anticipated to interfere with such access areas.
 - .6 Unless otherwise directed, comply with specified requirements of Section 01 14 00 - Work Restrictions.

1.6 Construction Zones near Runways and Taxiways

- .1 The Contractor shall be aware that any and all work within 40.0 meters from a runway centerline and 60.0 meters from a runway end, should only be undertaken when the runway is closed to air traffic or otherwise directed by Central Coastal Regional District. At the end of every closure, the Work must be completed to at least the granular base course level and to a minimum distance of 23.0 meters from the edge of the runway. Any unpaved area of such granular base must be well coated/bound with an asphalt tack coat application of 0.4 L/m² to 0.5 L/m². At the end of every closure, the area from 23.0 to 40.0 meters off the edge of the runway must be graded to have a downward slope not exceeding 5.0 % as measured in the direction away from the runway edge.
- .2 The Contractor shall be aware that all work at 40.0 meters and beyond from a runway centerline must comply with the 5H:1V Transitional Surface height restriction in accordance with TP312E5 requirements.
- .3 The Contractor shall be aware that all work within 12.5 meters of the centerline of any taxiway may only be undertaken when the taxiway is

closed to air traffic or when otherwise approved by the Central Coastal Regional District. At the end of every closure, the Work must be completed to at least the granular base course level and to the edge of the shoulders, then sloped 4H:1V. Any unpaved area of such granular base must be well coated/bound with an asphalt tack coat application of 0.4 L/m² to 0.5 L/m².

- .4 At the end of every closure, all runways and taxiways shall be cleaned by the Contractor by flushing with water and vacuum swept free of Foreign Object Debris (FOD). Surfaces will not be reopened until inspected and approved by the Central Coastal Regional District. Contractor shall allow sufficient time for inspection, so that surfaces can be opened at the specified time.

1.7 Unserviceable Areas

- .1 The Contractor shall mark off areas made unserviceable for aircraft by Work of this Contract by installation of temporary red lights, retroreflective cones, pedestrian barricades, and/or barriers and cones at the start of each work shift, and remove prior to taxiway or runway going back into service. NOTE: low profile barricades complete with red temporary lights and portable illuminated runway closure markers (or equivalent) are to be provided by the Contractor. Cost of installation complete with electrical cables, splicing to existing circuits, relocation from time to time, repair and removal at the completion will be measured and paid as specified in other sections. No additional payment will be provided for these markers and lights.
- .2 Open flames and inflammable fuels are not permitted. The Contractor shall obtain a fire permit through the Central Coastal Regional District when use of flames or inflammable fuels are required for the Work.
- .3 With respect to parking of equipment and stockpiling, the Contractor shall:
 - .1 Not park equipment or stockpile Material on the extended centerline of useable runway without the permission of Airport operations.
 - .2 Not park equipment or stockpile Material within 12.5 meters from the centerline of any taxiway without the permission of Airport operations.
 - .3 Not park equipment or stockpile any Material within a zone of 40.0 meters from useable runway centerline, and ensure that projections are below a ratio of 7H:1V beyond that zone.
 - .4 Not park equipment or stockpile any Material within a zone of 60.0 meters from runway ends, and ensure that projections are below a 4.0% vertical slope beyond that zone.
 - .5 Mark their highest projections with red lights, where directed.
- .4 Contractor is advised that, due to the possibility of jet blast or any turbulence from aircraft, all markers must be rigidly fixed and tied down, and all barricades and delineators shall be adequately weighed down or fixed by other approved means.

1.8 Trenching

- .1 On pavements open to aircraft traffic, the Contractor shall obtain the Airport Authorities written permission to undertake trenching which cannot be completed, backfilled and sealed within one working day.
- .2 The Contractor shall be aware that open trenches are not allowed adjacent to operational taxiway or runway.

1.9 Airport Facilities

- .1 Contractor shall arrange and pay for underground utility locates prior to construction. Locates shall include all communication cable, and power cable locations together with locations, of all underground utilities including sewer, water and gas lines. All locate sheets are to be signed and a copy provided to the Central Coastal Regional District and the Owner's Representative prior to carrying out any excavation.
- .2 Contractor is responsible to ensure that all subcontractors are aware of utility locations and that they have a copy of the locate sheet(s) prior to excavation.
- .3 Prior to machine digging, the contractor must expose (daylight) all adjacent identified, marked and staked utilities by non-destructive means, such as the use of Hydrovac equipment or equivalent method, so as not to damage existing utilities
- .4 Should the Contractor damage any existing utility, the Contractor shall, unless otherwise directed, immediately suspend operations at its own cost, immediately and advise the Central Coastal Regional District and the Owner's Representative.
- .5 Repair of damage, if any, and other associated costs are to be borne by the Contractor.

1.10 Dust Control

- .1 The Contractor shall provide dust control during construction and comply with requirements of Section 01 35 43 - Environmental Procedures.

1.11 No Smoking Policy

- .1 The Central Coastal Regional District has designated the Airside area and all buildings as NO SMOKING, except in designated areas. Smoking in vehicles on the Airside will not be permitted. This policy applies equally to all staff and Contractor's employees and subcontractors. Contractors are required to bring this policy to the attention of all their employees and subcontractors who will be required to work on the Airside area and all buildings and rigidly enforce this policy.

1.12 Measurement Procedures

- .1 No additional payment shall be made under the requirements of this section and the cost thereof will be deemed to be included in the Contract Price

END OF SECTION

PART 1 – GENERAL

1.1 Description

- .1 This section specifies the requirements for protection of the environment during the execution of the Contract

1.2 References

- .1 Definitions
 - .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically
 - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants
 - .3 Hazardous Material: product, substance, material or organism that could adversely affect the safety of the public or adversely affect wildlife or plants life if released to the environment

1.3 Submittals

- .1 Prior to commencing construction activities or delivery of materials to the site, submit within ten (10) days of Contract award an Environmental Protection Plan for review and acceptance by the Engineer/Owners Representative. The Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which must be addressed during Contract
- .2 The Environmental Protection Plan must include:
 - .1 Names of person or persons responsible for ensuring adherence to Environmental Protection Plan
 - .2 Names and qualifications of persons responsible for training site personnel
 - .3 Descriptions of environmental protection personnel training program
 - .4 Erosion and Sediment Control Plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations
 - .5 Drawings showing locations of proposed haul roads, stream crossings, as well as material storage areas. The plan should include methods to control runoff and to contain materials on-site
 - .6 Mitigation plans to address adverse weather conditions such as major precipitation events
- .7 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include

- measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas
- .8 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance
 - .9 Non-Hazardous Solid Waste Disposal Plan identifying methods and locations for solid waste disposal including clearing debris
 - .10 Air Pollution Control Plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off the project site
 - .11 Contaminant Prevention Plan that identifies potentially hazardous substances to be used on job site, intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials
 - .12 Wastewater Management Plan that identifies methods and procedures for management and/or discharge of wastewaters which are directly derived from construction activities
 - .13 Biological Resources Plan that defines procedures for identifying and protecting biological components at or adjacent to the site

1.4 Open Flames/Fires

- .1 Fires and burning of rubbish is not permitted on site. In the event an open flame is required for construction purposes, the contractor must obtain prior approval from the Engineer/Owners Representative

1.5 Waste Disposal

- .1 The contractor or any sub-contractors shall not bury rubbish and waste materials on-site
- .2 The contractor or any sub-contractors shall not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways

1.6 Drainage

- .1 Provide an Erosion and Sediment Control Plan identifying the type and location of erosion and sediment controls provided. Ensure the plan includes monitoring and reporting requirements to assure that the control measures are in compliance with the Erosion and Sediment Control Plan, Federal, Provincial, and Municipal laws and regulations
- .2 Provide temporary drainage and pumping as necessary to keep site free from water as required
- .3 The Contractor shall ensure that water does not collect in excavations from rainfalls during working hours or after hours when the Contractor is not on-site
- .4 Do not pump water containing suspended materials into waterways, sewers, or drainage systems. Ensure pumped water into waterways, sewers, or drainage systems is free of suspended materials
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements

1.7 Work adjacent to Waterways

- .1 The contractor or any sub-contractor shall not dump excavated fill, waste material or any other debris in waterways
- .2 The Contractor shall submit to the Engineer/Owners Representative for review, a plan detailing the methods of protecting adjacent waterways and floodplains during construction. Include the procedures to be followed to reduce and control the siltation of drainage courses and waterways. The plan shall show the types and locations of silt barriers, silt fences, flow

checks, energy dissipation, etc. The level of siltation entering waterways must meet Federal, Provincial and Local Guidelines. Should the planned methodology be found to be insufficient to control the siltation problem, the Contractor must immediately submit to the Engineer/Owners Representative an updated plan and take whatever action is necessary to correct the deficiency. The Contractor shall maintain all siltation controls in proper condition until completion of the Contract

- .3 The Contractor shall carry out routine inspection of installed flow checks on site. Remove and dispose of flow checks that are clogged and provide new replacement flow checks to ensure silt control is adequate at all times
- .4 Unless otherwise directed, the Contractor shall remove and dispose of all siltation protection devices and restore ditches and other locations to original condition including grading, topsoil and sodding, etc. at conclusion of Contract

1.8 Pollution Control

- .1 Maintain temporary erosion and pollution control features required to complete the work
- .2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, and provide temporary enclosures where indicated by the Engineer/Owners Representative
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for all roads used during construction
- .4 All spills of any nature must be reported to the Engineer/Owners Representative and cleaned up immediately to the satisfaction of the Engineer/Owners Representative, and in accordance with the Spill Response Plan

1.9 Notification

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

1.10 Spill Response

- .1 The Spill Response Plan must be able to be implemented to enable rapid and effective response in the event of a spill
- .2 The Contractor shall maintain response equipment readily available on site. Spill Response equipment such as absorbent material and open-ended barrels for collection of cleanup debris shall be stored in an accessible location on site
- .3 Construction personnel working on the project must be knowledgeable regarding spill response procedures as identified in the Spill Response Plan

- .4 Refuelling and maintenance of equipment must only occur at an approved area on level, hard surfaces areas away from sensitive receptor such as drainage areas
- .5 All heavy equipment, machinery and tools must be free from leaks. The Contractor shall repair or remove from the site any faulty equipment/machinery immediately

1.11 Dust Control

- .1 Excess dust from construction activities creates a serious hazard for airport operations and must be controlled at all times, including non-working hours
- .2 The Contractor shall maintain sufficient watering equipment on site at all times to suppress dust
- .3 In the event the Contractor fails to control dust emissions, the Engineer/Owners Representative reserves the right to cease all construction operations until adequate response measures have been taken. No claims for delay of contract can be made by the Contractor for this item. Any costs incurred by the Engineer or Owner for this work shall be deducted from future progress payment certificates due to the Contractor

1.12 Non-Maintenance Related Spills

- .1 The Contractor shall be responsible for spills occurring due to mishandling of fuels during the fueling process, failure of hoses or other components of equipment.
- .2 The Contractor shall submit a contingency plan for dealing with such occurrences to the Engineer/ Owner's Representative. The plan must describe in detail the action to be taken and the persons and agencies to be notified in the event of such spill

1.13 Enforcement

- .1 Protection of the environment is considered to be of prime importance
- .2 Progress payments will not be made to the Contractor while any requirements for Environmental Protection are outstanding
- .3 When the Engineer/Owners Representative provides direction to the Contractor with respect to action to be taken to correct environmental deficiencies must be acted upon immediately
- .4 In the event that deficiencies in work are not correct, the Engineer/Owners Representative will take the necessary action for correction purposes and will deduct the cost thereof from any funds due to the Contractor

1.14 Measurement Procedures

- .1 There will be no measurement for payment of this item. All associated costs are incidental to the contract

PART 2 – EXECUTION

2.1 Cleaning

- .1 Clean in accordance with Section 32 01 12 – Pavement Surface Cleaning
- .2 The Contractor shall:
 - .1 leave the work area clean at the end of each day
 - .2 ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials
 - .3 upon contract completion, remove any surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning

- .4 remove recycling containers and bins from the project site and dispose of materials at an appropriate facility

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for laboratory testing services to be provided by the Contractor during the execution of the work

1.2 References

- .1 All references to these Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments

1.3 Measurement Procedures

- .1 No separate payment will be made for testing laboratory services. The Unit rates and bid price bid shall include all labour, materials, tools, equipment, etc. as required by the Contractor to complete the quality control testing as specified under the various sections
- .2 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, the Contractor shall pay the costs for additional tests or inspections as the Engineer may require, to verify the acceptability of the corrected work

1.4 Contractor's Responsibilities

- .1 The Contractor is entirely responsible for the quality of material and products provided, and for the quality of the work completed
- .2 The Contractor is responsible for Quality Control and shall perform such inspections and tests as necessary to ensure that the work conforms to the requirements of the Contract Documents
- .3 During construction, the Contractor shall ensure that a sufficient number of tests are performed by the Contractor to determine that the material, product, and installation meet the specifications and contract drawings
- .4 This specification outlines the minimum requirements regarding Quality Control, however, the Contractor shall perform as many inspections and tests as necessary to ensure the work conforms to the specifications and contract drawings
- .5 Testing shall be in accordance with all applicable codes and regulations and with selected standards of the American Society for Testing and Materials and the Canadian Standard Association
- .6 Product testing, mill certificates and laboratory reports shall demonstrate that products and materials supplied by the Contractor, meet the specifications within the contract documents

1.5 Quality Control Testing

- .1 Quality Control Testing is the sole responsibility of the Contractor
- .2 The Contractor shall retain the services of an independent testing agency under supervision of a registered professional engineer, and pay the cost of laboratory testing and services for quality control
- .3 Quality control testing and laboratory services by the Contractor shall include, but not be limited to the following:
 - .1 Aggregate quality test for gravel and asphalt supplied to complete the work
 - .2 Aggregates and mix design for Hot Mixed Asphalt Concrete
 - .3 Moisture-density testing for soils and aggregates
 - .4 Gradation analysis
 - .5 Density compaction testing
- .6 HMAC quality control and product acceptance testing

- .7 All other testing as specified in these specifications
- .4 The Contractor shall provide on-site storage for laboratory use to store equipment and cure test samples
- .5 Pay costs for uncovering and making good on the work that is covered before required inspection or testing is completed and accepted by the Engineer/Owners Representative
- .6 Within 24 hours of a test being completed, the Contractor shall provide the Engineer/Owners Representative with copies of all test results
- .7 The Contractor is responsible for promptly processing and distributing all required copies of test reports and information and related instructions to his/her/their subcontractor and suppliers to ensure that all necessary testing/re-testing and replacement of construction can proceed without delay

1.6 Minimum Quality Control Testing Requirements

- .1 The table below identifies the minimum testing requirements the contractor must meet. This table is provided as the minimum requirement for Quality Control testing. The Contractor must still provide proof of material conformance with the requirements for products itemized in their respective specification.

Material	Testing Type	Minimum Test Frequency
Common Fill	Moisture-Density Relationship	Two (2) per material type
Subgrade Compaction	Proofroll	As directed by the Engineer/Owners Representative
Stockpiling of Granular Base and Subbase	Gradation and Crushed Count Atterberg Limits	Two (2) per day One (1) per week
Placing Granular Base and Subbase	Gradation and Crushed Count Moisture-Density Relationship Nuclear Density testing	One (1) per day Two (2) per material type
Stockpiling of Aggregate for Asphalt Concrete	Gradation and Crushed Count	Two (2) per day per aggregate type
Mix Production for Asphalt Concrete	Plant Marshall Test	Two (2) per day per mix
Placing Asphalt Concrete	Straight Edge Surface Defects	1 test /100m ² Continuous
Asphalt Concrete Compaction	Nuclear Density Testing	One (1) per 500 m ² per lift
Trench Bedding, Backfill, Common Fill, Base or Subbase Compaction	Nuclear Density Testing Moisture-Density Relationship	One (1) per 20 lm/lift One(1) per 1,000 m ² per lift

1.7 Inspection

- .1 The Contractor shall allow the Engineer/ Owner's Representative access to Work. If part of Work is in preparation at locations other than place of Work, allow access to such Work whenever and wherever it is in progress
- .2 The Contractor shall give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by the Engineer/Owner's Representative, or in accordance with requirements of authorities having jurisdiction
- .3 If Contractor covers or permits to cover Work that has been designated for special tests, inspections or approvals before such is made, Contractor shall uncover such Work, have inspections or tests satisfactorily completed and make good such Work at their own cost
- .4 The Engineer/Owner's Representative may order any part of Work to be examined if Work is suspected not to be in accordance with Contract documents

1.8 Quality Assurance Testing

- .1 Independent inspection/testing agencies may be engaged by the Engineer/Owner's Representative for purpose of quality assurance of the Work. Cost of such services will be borne by the Owner and coordinated by the Owner's Representative unless otherwise indicated
- .2 The Contractor shall provide assistance, as required, for executing inspection and testing, as specified or as directed at no additional cost
- .3 Employment of inspection/testing agencies does not relieve the Contractor of responsibility to perform his own quality control and Work in accordance with Contract Documents
- .4 If defects are revealed during quality assurance inspection and/or testing, the Owner's Representative will request additional inspection and/or testing to ascertain full degree of defect. The Contractor shall correct defect and irregularities as advised by the Owner's Representative at no additional cost to the Contract Price. The Contractor shall pay costs for retesting and re-inspection

1.9 Procedures

- .1 The Contractor shall notify appropriate agency and the Engineer/Owner's Representative in advance of requirement for tests, in order that attendance arrangements can be made
- .2 The Contractor shall submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work
- .3 The Contractor shall provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples. Refer to Section 01 52 00 – Construction Facilities

1.10 Rejected Work

- .1 The Contractor shall remove defective Work; whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not; which has been rejected by the Owner's Representative as failing to conform to Contract documents. Replace or re-execute in accordance with Contract documents
- .2 The Contractor shall make good other Contractors' work damaged by such removals or replacements promptly
- .3 If, in the opinion of the Engineer/ Owner's Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract documents, the Owner may deduct from Contract Price difference

in value between Work performed and that called for by Contract documents, amount of which shall be determined by the Owners Representative

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

- .1 Related Sections
- .2 Action and Information Submittals
- .3 Installation and Removal
- .4 Dewatering
- .5 Water Supply
- .6 Temporary Power and Light
- .7 Temporary Communication Facilities
- .8 Fire Protection
- .9 Temporary Erosion and Sedimentation Control

1.2 Related Sections

- .1 Section 01 14 00 – Work Restrictions
- .2 Section 01 15 50 - Special Provisions
- .3 Section 01 33 00 – Submittal Procedures
- .4 Section 01 35 13 – Special Project Procedures for Airport Facilities
- .5 Section 01 35 43 – Environmental Procedures
- .6 Section 01 52 00 – Construction Facilities
- .7 Section 01 74 00 – Cleaning

1.3 Action and Informational Submittals

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

1.4 Installation and Removal

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

1.5 Dewatering

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

1.6 Water Supply

- .1 Contractor will provide continuous supply of potable water for construction use.
- .2 Contractor to arrange for connection with appropriate utility company and pay costs for installation, maintenance, and removal.
- .3 Contractor will pay for utility charges at prevailing rates, based on General Conditions of Contract.

1.7 Temporary Power and Light

- .1 Contractor will provide and pay for temporary power during construction for temporary lighting and operating of power tools and equipment, to complete the Work.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance, and removal.
- .3 Provide and maintain temporary lighting throughout project as necessary.

1.8 Temporary Communication Facilities

- .1 Provide and pay for temporary Wi-Fi hook up necessary for own use and use of Central Coastal Regional District and Engineer.

1.9 Fire Protection

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

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and airport tenants.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed

END OF SECTION

PART 1 – GENERAL

1.1 Description

- .1 This section specifies the requirements for temporary construction facilities during the execution of the Contract

1.2 References

- .1 All references to this Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN / CGSB 1.189-00, Exterior Alkyd Primer for Wood
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1 / A23.2-04, Concrete Materials and Methods of Concrete Construction / Methods of Test and Standard Practices for Concrete
 - .2 CSA-0121-1978(R2003), Douglas Fir Plywood
 - .3 CAN / CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes
 - .4 CAN / CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment
- .4 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004

1.3 Measurement Procedures

- .1 Temporary erosion and sediment control shall be included in the mobilization and demobilization lump sum
- .2 Temporary facilities shall be included in the mobilization and demobilization lump sum
- .3 No additional payment will be made for the supply, erection, installation of temporary construction facilities required to complete the work. The cost of all of these facilities shall be included in the mobilization and demobilization lump sum

1.4 Submittal Procedures

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

1.5 Installation and Removal

- .1 Identify areas which have to be graveled to prevent tracking of mud
- .2 Indicate use of supplemental or other staging area
- .3 Provide construction facilities in order to execute work expeditiously
- .4 Remove from site all such work after use
- .5 In the event of snowfall, the Contractor shall provide snow removal as required during the period of work
- .6 Clean roads, runways, taxiways and apron areas where used by the Contractor's equipment and as directed by the Engineer/Owners Representative
- .7 Provide and maintain adequate and safe access to project sites

1.6 Site Storage/Loading

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

1.7 Construction Parking Facilities

- .1 Designated parking space will be made available on site. Maintain and administer these spaces in a safe manner
- .2 Provide and maintain adequate access to construction parking facilities for the duration of the Work.
- .3 Clean apron, runway and taxiway areas where used by the Contractor's equipment

1.8 Security

Contractor responsible for providing and paying for responsible security personnel to guard site and contents of site after working hours and during holidays

1.9 Equipment, Tool and Material Storage

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities
- .3 Provide adequate weather tight sheds with raised floors, for storage of materials, tools, and equipment which are subject to damage by weather

1.10 Water Supply

- .1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances

1.11 Power Supply

- .1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances
- .2 Install temporary facilities for power such as pole lines and underground cables to approval of the local power supply authority

1.12 Sanitary Facilities

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

1.13 Construction Signage

- .1 Provide and erect project sign, at least 2 weeks prior to Construction, in a location designated by the Engineer
- .2 Construction sign to be of wood frame and plywood construction, painted with exhibit lettering produced by a professional sign painter
- .3 Indicate on the sign, the name of Owner, Engineer, and Contractor of design style established by the Engineer
- .4 No other signs or advertisements, other than warning signs, are permitted on site

1.14 Protection and Maintenance of Traffic

- .1 Provide access and temporary relocated roads as necessary to maintain traffic
- .2 Maintain and protect traffic on affected roads during the construction period except as otherwise specifically directed by the Engineer/Owners Representative
- .3 Provide measures for protection and diversion of traffic, including provision of flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect the travelling public from damage to person and property

- .5 The Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic
- .6 Verify adequacy of existing roads and allowable load limit on these roads. The Contractor is responsible for repair of damage to roads caused by construction operations
- .7 Construct access and haul roads as necessary
- .8 Haul roads to be constructed with suitable grades and widths; sharp curves, blind corners and dangerous cross traffic shall be avoided
- .9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic
- .10 Dust control: adequate to ensure safe operation at all times
- .11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by the Engineer
- .12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations
- .13 Provide snow removal during the period of the Work
- .14 Remove, upon completion of work, haul roads designated by the Engineer/Owners Representative

1.15 Site Clean-Up

- .1 Remove construction debris, waste materials, packaging material from the work site daily
- .2 Clean dirt or mud tracked onto paved or surfaced roadways/ aprons/ taxiways/runways
- .3 Store materials resulting from demolition activities that are salvageable
- .4 Do not stack stored new or salvaged material in construction facilities

PART 2 – EXECUTION

2.1 Temporary Erosion and Sedimentation Control

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of the authorities having jurisdiction
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

- .1 Reference Standards
- .2 Qualifications of Surveyor
- .3 Survey Reference Points
- .4 Survey Requirements
- .5 Existing Services
- .6 Records
- .7 Action and Informational Submittals
- .8 Subsurface Conditions

1.2 Related Sections

- .1 Section 01 14 00 – Work Restrictions
- .2 Section 01 15 50 - Special Provisions
- .3 Section 01 33 00 – Submittal Procedures
- .4 Section 01 35 13 – Special Project Procedures for Airport Facilities
- .5 Section 01 35 43 – Environmental Procedures
- .6 Section 01 52 00 – Construction Facilities
- .7 Section 01 74 00 – Cleaning

1.3 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 4-2011, Unit Price Contract.
- .2 Owner's identification of existing survey control points and property limits.

1.4 Qualifications of Surveyor

- .1 Qualified registered land surveyor, licensed to practise in Place of Work, acceptable to Central Coastal Regional District.

1.5 Survey Reference Points

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Central Coastal Regional District.
- .4 Report to Central Coastal Regional District when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.6 Survey Requirements

- .1 Establish [two] permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading, fill [and topsoil] placement [and landscaping features].
- .4 Stake slopes [and berms].
- .5 Establish pipe invert elevations.
- .6 Stake batter boards [for foundations].
- .7 Establish foundation [column locations] and floor elevations.
- .8 Establish lines and levels for mechanical and electrical work.

1.7 Existing Services

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Central Coastal Regional District of findings.

1.8 Records

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

1.9 Action and Informational Submittals

- .1 Submit name and address of Surveyor to Central Coastal Regional District.
- .2 On request of Central Coastal Regional District, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying [and noting] those elevations and locations of completed Work that conform [and do not conform] with Contract Documents.
- .4 Prior to the commencement of work for each phase, notify Central Coastal Regional District and Airport tenants of required closures and ensure safety barricades are in place prior to the start of construction.

1.10 Subsurface Conditions

- .1 Promptly notify Central Coastal Regional District in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should Contract Administrator determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for the cleaning of the project site during the time of the Work and also at the completion of the Project.

1.2 General

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws
- .2 Store volatile waste in covered metal containers, and remove from the premises at the end of each working day
- .3 Dust control shall be exercised as required and as directed by Central Coastal Regional District. Containers shall supply the necessary water truck(s) as required for dust control purposes
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris
- .5 Dispose of waste materials and debris in coordination with Central Coastal Regional District.
- .6 The contractor shall maintain sufficient labourers and minimum one (1) functional Sweeper(s) for cleaning onsite.
- .7 The contractor shall ensure all pavement surfaces are clear of debris.
- .8 Pavement surface cleaning shall be completed daily, immediately prior to pavement Paint marking applications, immediately prior to full demobilization, and as required by the resident engineer.
- .9 The contractor shall ensure all off-pavement graded surfaces are free of loose debris, and any material exceeding 25 mm (1") in diameter.
- .10 Off-pavement graded surface cleaning shall be completed regularly, immediately prior to demobilization, and as required by the resident engineer.

1.3 Cleaning During Construction

- .1 Maintain the Work in a tidy condition, free from the accumulation of waste products and debris, including those caused by the Owner or other Contractors
- .2 Contractor to continually assess that no piece of materials or any other object has been dropped on a runway or taxiway or apron surface by equipment during travelling to and from the site or during construction activities
- .3 Clear snow and ice and remove from site as required to complete the Work
- .4 Provide on-site containers for collection of waste materials and debris
- .5 Provide and use separate marked bins for recycling
- .6 For Work on or in the vicinity of airside pavements, provide continuous cleaning of dust and debris as necessary to prevent damage to aircraft
- .7 Prevent materials, debris, rubbish from blowing onto the aircraft maneuvering surfaces at all times.
- .8 Clean lighting reflectors, lenses and other lighting installations as directed by the Engineer at no additional cost.
- .9 Maintain the Construction Laydown Area(s) in a clean and orderly manner at all times.

1.4 Final Cleaning Post Construction

- .1 When the Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of the remaining Work
- .2 Remove all waste products and debris, and leave the Work area clean
- .3 Prior to the final review remove surplus products, tools, construction machinery and equipment
- .4 Restore the Contractor Yard to its original condition, including any necessary grading as required to the satisfaction of Central Coastal Regional District.
- .5 Clean lighting reflectors, lenses, and other lighting surfaces
- .6 Remove dirt and other disfiguration from exterior surfaces
- .7 Sweep and wash clean paved areas
- .8 Remove debris and surplus materials from crawl areas and other accessible concealed spaces
- .9 All pavements shall be cleaned of mud, cement slurry or any other deleterious materials prior to final inspection
- .10 Broom clean paved surfaces and rake clean other surfaces of grounds
- .11 Flush and clean out manholes and catchbasins including gratings
- .12 Haul surplus or salvage materials that are the property of the Owner to the Owner's storage site
- .13 Clean haul routes and restore to pre-construction condition

1.5 Measurement for Payment

- .1 No separate payment will be made for cleaning of the project site during or after the work is completed. All costs related to cleaning are incidental to the Work.

END OF SECTION

PART 1 – GENERAL

1.1 Description

- .1 This section specifies the administrative procedures preceding the preliminary and final inspection of the Work

1.2 References

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 78 00 – Closeout Submittals

1.3 Contractor Inspection

- .1 The Contractor, including any and all subcontractors, shall conduct an inspection of the Work, and identify any and all deficiencies and defects, and repair as required to conform to the Contract Documents
- .2 The Contractor shall notify the Engineer/Contract Administrator, in writing, of satisfactory completion of the Contractor's inspection and the corrections which have been made and shall request an inspection by the Engineer/Contract Administrator

1.4 Engineer/Contract Administrator Inspection

- .1 The Engineer/Contract Administrator will perform an inspection of the Work to identify obvious defects and deficiencies. The Contractor shall correct the identified deficiencies and defects as required
- .2 The inspection by the Engineer/Contract Administrator does not relieve the Contractor from responsibility for other defects or deficiencies which are not reported during the inspection

1.5 Project Completion

- .1 The Contractor shall submit a written certificate to the Engineer/Contract Administrator stating that the following has been performed:
 - .1 Work has been completed and inspected for compliance with the Contract Documents
 - .2 Defects have been corrected and deficiencies have been completed
 - .3 Work is complete and is ready for final inspection

1.6 Final Inspection

- .1 When items identified above are completed, the Contractor shall request a final inspection of the Work by the Engineer/Contract Administrator and Contractor. If the Work is deemed incomplete by the Engineer/Contract Administrator, the Contractor shall complete those outstanding items and request a re-inspection upon completion
- .2 If the Work is deemed to be incomplete, the Owner shall charge for the cost of the Engineer/Contract Administrator time and effort to re-inspect the work upon completion

1.7 Declaration of Substantial Completion

- .1 When the Engineer/Contract Administrator considers all deficiencies and defects corrected and the submission of documents in accordance with Section 01 78 00 is completed and compliance with the requirements of the Contract have been substantially performed, the Contractor shall make an application for certificate of Substantial Completion

1.8 Liens and Warranty Period and Holdback

- .1 The Contractor shall note the commencement of the lien and warranty period and shall contain the date of acceptance of submitted declaration of Substantial Performance.
- .2 After the issuance of certificate of Substantial Performance of the Work and forty-five (45) days after providing certificate of publication, the Contractor shall apply for payment for the holdback amount
- .3 When the Engineer/Contract Administrator considers final deficiencies and defects have been corrected and/or repaired and it appears the Work has been totally performed, the Contractor shall apply for final payment. The Work is deemed incomplete, the Contractor shall repair those items and request a re-inspection at the Cost of the Contractor.

1.9 Measurement for Payment

- .1 No additional payment will be made for compliance with the procedures or preparation work for closeout procedures or steps and cost thereof will be deemed to have been included in the Contract Price

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

- .1 Section 01 14 00 – Work Restrictions
- .2 Section 01 15 50 - Special Provisions
- .3 Section 01 33 00 – Submittal Procedures
- .4 Section 01 35 13 – Special Project Procedures for Airport Facilities
- .5 Section 01 35 43 – Environmental Procedures
- .6 Section 01 52 00 – Construction Facilities
- .7 Section 01 74 00 – Cleaning
- .8 Section 01 74 19 – Waste Management and Disposal

1.2 Administrative Requirements

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with contractor's representative and the Central Coastal Regional District to:
 - .1 Verify Project requirements.
 - .2 The Central Coastal Regional District to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.3 Action and Informational Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures
- .2 Provide evidence, if requested, for type, source and quality of products supplied.

1.4 Format

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf [219 x 279] mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .6 Text: manufacturer's printed data, or typewritten data.
- .7 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.
- .8 Provide [1:1] scaled CAD files in dwg format on USB.

1.5 Contents – Project Record Documents

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of consultant(s) and Contractor with name of responsible parties.

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

1.6 As-Built Documents and Samples

- .1 Maintain, Provide, in addition to requirements in General Conditions, at the request from Central Coastal Regional District, one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.

1.7 Final Survey

- .1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

- .1 Section 32 01 12 – Pavement Surface Cleaning

1.2 Measurement for Payment

- .1 Partial depth removal of existing airfield asphalt pavement by milling will be measured in square meters actually removed at the depths as identified in the Contract Drawings. Price will include saw cutting and milling to remove designated pavement thickness to match design elevations. Price to include loading, hauling, salvaging, stockpiling, removal from site, and cleaning of remaining milled pavement surface. Milled material must be disposed of off site at no additional cost to the Owner. There will be no additional payment for milling stockpiling/double handling.
- .2 Full depth removal of existing airfield asphalt pavement by milling will be measured in square meters actually removed regardless of the depth of asphalt removed or number of operations required. Price will include saw cutting, milling, loading, hauling, salvaging, stockpiling, and removal from site. There will be no additional payment for milling stockpiling/double handling.

PART 2 - PRODUCTS

2.1 Equipment

- .1 Use cold milling, planning, or grinding equipment with automatic grade controls, capable of operating from stringline, and capable of removing partial depth of pavement surface to depths or grades as indicated in the Contract Drawings.

PART 3 - EXECUTION

3.1 Preparation

- .1 Prior to commencing asphalt removal operations, inspect and verify the areas to be removed with the Engineer/Owners Representative.
- .2 Protect existing pavement not designated for removal, airfield lighting infrastructure, and signs from damage. In the event of damage, immediately replace or make repairs to the acceptance of the Engineer/Owners Representative at no additional cost

3.2 Excavation

- .1 Remove existing asphalt pavement to the lines and grades as indicated in the Contract Drawings and established in the field with the Engineer/Owners Representative.
- .2 Use equipment and methods of removal and hauling which do not damage or disturb underlying pavement
- .3 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or any other material.
- .4 Suppress dust generated by the removal process.

3.3 Cold Milling

- .1 Mill to depth and/or grade line as indicated.
- .2 Mill pavement to expose vertical surface of gutter face, manhole frames, water valves, survey monuments, power, telephone, water vaults, or any other structure within the milling area, for the full required depth of milling.
- .3 Direct all millings to the north end of the airport as indicated on the Contract Drawings. RAP should be placed and compacted on a properly graded surface

3.4 Finish Tolerances

- .1 Finished surfaces in areas where asphalt pavement has been removed to be within +/- 5 mm of grade specified but not uniformly high or low.

3.5 Cleaning

- .1 Clean in accordance with Section 32 01 12 – Pavement Surface Cleaning
- .2 Contractor to leave work area clean at the end of each day.
- .3 Upon completion, the contractor is responsible for removing surplus materials, rubbish, tools and equipment in accordance with Section 32 01 12 – Pavement Surface Cleaning.
- .4 Sweep remaining asphalt pavement surfaces clean and free of debris resulting from removal operations, using rotary powered brooms and hand brooming as required, to the satisfaction of the Engineer/Owners Representative.

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for aggregate and granular materials incorporated in various portions of the work

1.2 Related Sections

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 32 11 23 – Aggregate Base Courses
- .3 Section 32 12 16 – Asphalt Paving

1.3 References

- .1 All references to the following Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
 - .2 ASTM C117, Standard Test Methods for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing
 - .3 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - .4 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
 - .5 ASTM D422, Standard Test Method for Particle-Size Analysis of Soil
 - .6 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³)(600 kN-m/m³)
 - .7 ASTM D1557, Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³)(2,700 kN-m/m³)
 - .8 ASTM D1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils
 - .9 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils
- .3 CSA A23.1/A23.2 – Concrete materials and methods of concrete construction/test methods and standards practices for concrete
 - .1 CSA-A23.2-1A Sampling aggregates for use in concrete
 - .2 CSA-A23.2-12a Relative density and absorption of coarse aggregate
 - .3 CSA-A23.2-6A Relative Density and absorption of fine aggregate
 - .4 CSA-A23.2-16A Resistance to degradation of small-size coarse aggregate by abrasion and impact in the Los Angeles machine
 - .5 CSA-A23.2-17A Resistance to degradation of large-size coarse aggregate by abrasion and impact in the Los Angeles machine
 - .6 CSA-A23.2-9A Soundness of aggregate by use of magnesium sulphate
 - .7 CSA-A23.2-2A Sieve analysis of fine and coarse aggregate
 - .8 CSA-A23.2-5A Amount of material finer than 80 micrometer in aggregate

- .9 CSA-A23.2-23A Test method for the resistance of fine aggregate to degradation by abrasion in the Micro-Deval apparatus
- .10 CSA-A23.2-24A Test Method for the resistance of unconfined coarse aggregate to freezing and thawing

1.4 Submittals

- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures
- .2 Allow continual sampling by the Engineer during production
- .3 Provide Engineer with access to source and processed material for sampling
- .4 Install sampling facilities at discharge end of production conveyor, to allow the Engineer to obtain representative samples of items being produced. Stop conveyor belt when requested by Engineer to permit fill cross section sampling.
- .5 Provide suitable equipment including a trained operator for stockpile sampling as necessary. Move samples to storage place as directed by the Engineer.
- .6 Contractor to cover costs of sampling and testing of aggregates which fail to meet specified requirements.
- .7 Provide water, electric power, and propane to the Engineer laboratory trailer at production site.
- .8 For existing stockpiles of material, submit results of Quality Control testing to Engineer at least two weeks prior to delivery of aggregate to the site.
- .9 For material produced during the course of the work, submit the results of the Quality Control testing within 24 hours of test completion.
- .10 Submit samples of aggregate (minimum 50 kg) as requested by the Engineer for Quality Assurance testing. Provide the Engineer with access to aggregate sources if requested.

1.5 Measurement for Payment

- .1 No measurement to be made under this section. Include costs in appropriate tender items

1.6 Waste Management and Disposal

- .1 Contractor to divert unused granular material from landfill to local facility as accepted by the Engineer.

PART 2 - PRODUCTS

2.1 General

- .1 Aggregate quality: 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.
- .2 All materials shall be supplied by the contractor.

2.2 Material

- .1 Flat and elongated particles of coarse aggregate to ASTM D4791
 - .1 Greatest dimension to exceed five times least dimension
- .2 Fine Aggregates satisfying requirements of applicable section to be one or a blend of the following:
 - .1 Natural sand
 - .2 Manufactured Sand
 - .3 Screenings produced in crushing of quarried rock, boulders, gravel, or slag
- .3 Coarse Aggregates satisfying requirements of applicable section to be one or a blend of the following:
 - .1 Crushed Rock
 - .2 Gravel and crushed gravel comprised of naturally formed particles of stone
 - .3 Light weight aggregate, including slag and expanded shale

2.3 Quality Control

- .1 Quality Control shall be the responsibility of the Contractor. Quality Assurance test performed by the Contract Administrator shall not be considered Quality Control test.
- .2 The Contractor shall use Professional Engineering services and a CSA certified testing laboratory licensed to practice in the Province of British Columbia to assess and where necessary, modify the aggregate materials being produced to ensure their end use meets all specifications.
- .3 Advise the Contract Administrator 2 weeks in advance of proposed change of material source.
- .4 Inspection or testing by the Contract Administrator shall not in any form relieve the Contractor of the responsibility for providing aggregates that meet the specifications in all respects.
- .5 Quality Control testing frequency shall be completed as per the following table:

Test	Standard	Frequency
Sieve Analysis: Crushed or Screened Aggregate or Sand	ASTM C136	One (1) per 1,000 tonnes of aggregate produced
Sieve Analysis: Pit-run Aggregate or Sand	ASTM C136	One (1) per 1,000 tonnes of aggregate produced
Percent Fracture	The percentage of fractured materials will be determined by examining the fraction retained on the 5 mm sieve and dividing the mass of the fractured particles having two (2) or more fractured faces by the total mass retained on the 5 mm sieve	One (1) per 5,000 tonnes of aggregate produced
L.A Abrasion	ASTM C131	One (1) per 10,000 tonnes of aggregate produced

2.4 Quality Assurance Testing

- .1 Refer to Section 01 45 00 – Quality Control
- .2 Submit aggregate samples (minimum 50 kg) as requested by the Contract Administrator for Quality Assurance Testing. Provide the Contract Administrator with access to aggregate sources if requested.

PART 3 - EXECUTION

3.1 Preparation

- .1 Processing
 - .1 Process aggregate uniformly using methods that prevent contamination, segregation, and degradation.
 - .2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particles shapes, as specified
 - .3 Wash aggregates, if required to meet specifications.
 - .4 Use only equipment approved by the Owners Representative.
 - .5 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.
- .2 Handling
 - .1 Handle and transport aggregates to avoid segregation, contamination, and degradation.
- .3 Stockpiling
 - .1 Stockpile aggregates on site in locations as indicated in the Contract Drawings or otherwise directed by the Contract Administrator/Owners Representative. Do not stockpile on completed pavement surfaces.
 - .2 Stockpile aggregates in sufficient quantities to meet the Project Schedule.

- .3 Stockpiling locations to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
- .4 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
- .5 Do not use intermixed or contaminated materials.
- .6 Remove and dispose of rejected materials as directed by the Engineer within 48 hours of rejection.
- .7 Stockpile materials in uniform layers of thickness as follows:
 - .1 Max 1.5 m for all aggregate materials
- .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .9 Do not cone piles of spill material over edges of piles.
- .10 Do not use conveying stackers.
- .11 During winter operations, prevent ice and snow from becoming mixed into the stockpile or in material being removed from stockpile.

3.2 Cleaning

- .1 Leave aggregate stockpile site in tidy, well-drained condition, free of standing surface water
- .2 Leave any unused aggregates in neat compact stockpiles as directed by the Engineer/Owners Representative

3.3 Weighing of Aggregates

- .1 Weight aggregates as required for measurement and payment. Include the cost of weigh scales, including installation, operation, issuance of weigh tickets, and removal, in the unit price for items measured by weight.

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for common excavation and backfilling, stock piling or disposal of material off site

1.2 Related Sections

- .1 Section 01 33 00 – Special Provisions – Airport In Use
- .2 Section 31 05 17 – Aggregate Materials
- .3 Section 32 11 23 – Environmental Protection
- .4 Section 32 12 16 – Sitework Demolition and Removal
- .5 Section 32 91 21 – Topsoil Placement and Grading

1.3 References

- .1 All references to the following Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM C117, Standard Test Methods for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing
 - .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
 - .3 ASTM D422, Standard Test Method for Particle-Size Analysis of Soil
 - .4 ASTM D4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 - .8 ASTM D1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils
 - .9 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils
- .3 CSA/CGSB-8.2, Sieves, Testing, Woven Wire, Metric

1.4 Measurement for Payment

- .1 Measurement for payment for excavation shall be paid by volume of cubic meters removed as measured by the Contractor in the original locations, and as accepted by the Contract Administrator including excavation, dust control, measurements, loading, hauling, and disposing of material off site.
- .2 Subgrade preparation, compaction and proof rolling to be measured in square meters.
- .3 Supply and install of geotextile and geogrid material to be measured in square meters.
- .4 Topsoil stripping and placement to be measured in square meters.

1.5 Definitions

- .1 Excavation shall include the following:
 - .1 Excavation and disposal of unusable material
 - .2 Excavation for the preparation and construction of subgrade for access roads, runways, taxiways and aprons.
 - .3 Excavations for sub-cuts and backfill of sub-cuts
 - .4 Excavation for the construction of drainage ditches and bio swales
 - .5 Excavation for construction of access for parking areas for vehicle, construction equipment and aircraft
 - .6 Trimming and rounding of slopes

- .7 Transportation of excavated material from excavation area to stockpile or disposal area as indicated regardless of transportation distance
- .8 Construction of detours or other suitable provision to accommodate traffic during construction including vehicle, aircraft or pedestrian movement
- .9 Maintaining the work in a finished condition until it has been accepted by the Contract Administrator
- .2 Two (2) classes of excavation are recognized: Common Excavation and Rock Excavation
 - .1 Common Excavation is defined as the excavation of materials of whatever nature, which are not included under the definition of rock excavation, including dense tills, hardpan and frozen materials and partially cemented materials which can be ripped and excavated with heavy construction equipment
 - .2 Rock excavation is defined as material from solid masses of igneous, sedimentary or metamorphic rock which was integral with its parent mass and boulders or fragments of rock having individual volume in excess of 1 m³
 - .3 Unclassified excavation: excavation of deposits of whatever character encountered in work
- .3 Two classes are recognized for compaction purposes: Cohesionless soils and cohesive soils
 - .1 Cohesionless Soil are defined as soils which have less than 20% passing the 0.075 mm sieve, when tested to ASTM C117, regardless of plasticity of fines and soils containing between 20% to 50% passing the 0.075 mm sieve and having a liquid limit less than 25% and a plasticity index less than 6% when tested to ASTM D4318
 - .2 Cohesive soil: soil not having properties to be classified as cohesionless
- .4 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding
- .5 Waste material: excavated material unsuitable for use in work or surplus to requirements to be disposed as directed
- .6 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of work
- .7 Pavement structure: combination of layers of unbound or stabilized granular sub-base, base, and asphalt or concrete surfacing
- .8 Subgrade elevation: Elevation immediately below base or sub-base, whichever is lower
- .9 Subcut: Excavation within or below the subgrade to length, width, and depth established by the Contract Administrator
- .10 Common Fill: Material derived from usable excavation and placed above original ground or stripped surface up to subgrade elevation
- .11 Subgrade: In fills, the material confined between subgrade elevation and original ground, and between sideslopes; in cuts, the material below subgrade elevation confined between sideslopes.
- .12 Stripping: Material composed of organic, unsuitable for common fill regardless of moisture content
- .13 Unusable materials are a) Weak and compressible materials under pavement areas; and b) frost susceptible materials under pavement area.

1.7 Waste Management and Disposal

- .1 Contractor to divert unused topsoil and granular material as indicated or as directed by the Engineer. No stockpiling of material shall be left at the airport following project completion

PART 2 - PRODUCTS

2.1 Materials

- .1 Fill Materials: to acceptable of Contract Administrator
- .2 Material used for common fill shall not contain more than 3% organic matter by mass

PART 3 - EXECUTION

3.1 Stripping of Topsoil

- .1 Commence topsoil stripping of areas as indicated after area has been cleared of brush, weeds and grasses and these materials removed from site.
- .2 Strip topsoil to depths as indicated. Do not mix topsoil with subsoil.
- .3 Stockpile in locations as indicated to a max height of 2 m
- .4 Dispose of unused topsoil off site

3.2 Excavating

- .1 General
 - .1 Excavate to lines, grades, elevations and dimensions as indicated or as directed by the Contract Administrator
 - .2 Ensure drainage of excavated areas and maintain crowns and cross slopes to provide surface drainage. Do not allow standing water to occur on the excavated or fill surface at any time
 - .3 Notify the Contract Administrator whenever unsuitable materials are encountered in cut sections, remove unsuitable materials as directed and replace with material approved by Engineer to depth and extent as directed
 - .4 Treat ground slopes at grade points, where subgrade is on transition from excavation to embankment or earth to rock, as indicated or as directed by the Contract Administrator
- .2 Do not disturb foundation materials of adjacent pavements or structures which are to remain in place
- .3 Unsuitable or surplus material
 - .1 Disposal of unsuitable or excess material shall be at locations as indicated in the Contract Documents or as directed by the Central Coastal Regional District

3.3 Placing Fill

- .1 Before taking material from borrow areas, completely use, in fill areas, suitable materials removed from excavation
- .2 Do not place material which is frozen nor place material on frozen surfaces
- .3 Maintain crowned surface during construction to ensure run-off of surface water. Do not place material in free standing water. Drain low areas, before placing material
- .4 Blade surface regularly to eliminate rutting

- .5 Begin common fill construction full width. Spread material in horizontal layers over the length of the fill area to prevent pockets of materials with different properties being placed side by side in the fill area
- .6 When directed, scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces. Method used to be subject to prior acceptance by the Contract Administrator
- .7 Break up or scarify existing surface prior to placing common fill material
- .8 The Contractor shall have sufficient graders, water trucks, and rollers onsite to meet the specified spreading and compaction requirements for the amount of material hauled in each lift. The Contract Administrator reserves the right to order the discontinuance of use of any equipment or method which, in his opinion, fails to produce satisfactory results
- .9 When common fills are to be placed over swampy or saturated ground, the Contractor may be permitted to end dump an initial lift of accepted material of sufficient depth to support hauling equipment
- .10 Do not place stones and boulders exceeding 50mm maximum dimension within 100 mm of finished surface in graded areas

3.4 Compaction

- .1 Shape and roll alternately to obtain smooth, even, and uniform compacted layers
- .2 When necessary, apply water during compaction to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected
- .3 Any soft, weak, or otherwise unsuitable material discovered at any stage of the work shall be excavated to the depth and extent designated by the Contract Administrator. The material shall be replaced by suitable material
- .4 Quality assurance testing of materials will be carried out by the testing laboratory designated by the Contract Administrator. Quality control testing of materials will be carried out by the testing laboratory designated by the Contractor, at a higher frequency
- .5 Should the surface become rutted or disturbed for any reason prior to or during the placing of the next layer, the Contractor shall re-grade and re-compact the subgrade at his own expense
- .6 Place and compact to full width in layers not exceeding 200 mm loose thickness for fine-grained soil and 300 mm for granular soil. The Contract Administrator may accept thicker lifts if specified compaction can be achieved and if material contains more than 25% by volume stone or rock fragments larger than 100mm
- .7 Break soil down to a size suitable for compaction and mix for uniform moisture and soil conditions to full depth of layer
- .8 Compact each layer to at least a minimum of 95% Modified Proctor Density (MPD) and not less than 98% MPD for final 300 mm of subgrade fill. (ASTM D1557)
- .9 During performance of the work, sufficient water shall be added or the soil shall be aerated to bring the moisture content to within $\pm 2\%$ of optimum required for compaction
- .10 The moisture content shall be maintained at $\pm 2\%$ of the optimum moisture content as defined by ASTM D1557 until the next layer is placed

3.5 Subgrade Compaction in Pavement Areas

- .1 Fill area: do not place stones and boulders exceeding 150 mm maximum dimension within 500 mm of subgrade elevation
- .2 Remove stones and boulders, in cut areas, exceeding 150 mm maximum dimension within specified depth, for subgrade compaction
- .3 Scarify and mix pavement subgrade surface to 300 mm below subgrade elevation
- .4 Break material down by means of scarifiers, plows, discers or other suitable equipment. Scarify and disc the material until the soil is broken down to a uniform size suitable for ensuring moisture conditioning will be uniform for the full depth specified
- .5 Bring moisture content to +/- 2% of the optimum moisture content (ASTM D1557) for each given material. Add water or aerate using a discer to uniformly mix the material for the full depth specified
- .6 Shape subgrade to required cross section and grade and to the tolerances specified
- .7 Compact each layer to at least a minimum of 95% Modified Proctor Density (MPD) and not less than 98% MPD for final 300 mm of subgrade fill (ASTM D1557). Compaction equipment to be sheepsfoot type
- .8 Bring moisture content of soil to level required to achieve specified compaction. Add water or aerate as required.
- .9 Remove upper portion to depth necessary, when subgrade preparation and compaction cannot be achieved to requirement in single layer, to achieve requirement. Remove, replace and compact such materials at no extra cost to the Contract Administrator
- .10 Remove upper portion to depth, when subgrade preparation and compaction can not be achieved to requirement in single layer, to achieve requirement. Remove, replace and compact such materials at no extra cost to Central Coastal Regional District.

3.6 Finishing and Tolerances

- .1 Blade finished ditch subgrade surfaces in cut and fill areas free from ruts, depressions, rock in excess of 75 mm and debris. Hand finish areas that cannot be finished satisfactorily by machine.
- .2 Finished ditch subgrade to be within 30 mm of design elevations, but not uniformly high or low.
- .3 Fine grade finished subgrade to be free from ruts, depressions, rock in excess of 75 mm, and debris and attain a tight dense surface
- .4 Following fine grading, static rolling subgrade surface using a smooth drum type roller can be done (if needed), to help attain a tight dense condition.
- .5 Finished subgrade to be within 30 mm of design elevations, but not uniformly high or low.
- .6 Finished subgrade surfaces to be free from depressions exceeding 30 mm in 5 m.

3.7 Placing Topsoil

- .1 Place topsoil after acceptance of subgrade
- .2 Spread topsoil to depths as indicated. Remove surface stones, roots and other debris and leave surface in uniform condition.
- .3 Pavement edges, drainage structures, and electrical fixtures shall be flush with surface topsoil, with no vertical edges or lips exceeding 50 mm (2"). surface and resistant to future erosion.

- .4 Screened surface topsoil (Section 32 91 21) in graded areas shall be free of deleterious material (i.e. rocks, stones, branches, roots, etc.) exceeding 25 mm (1") in diameter.
- .5 No standing water permitted in all graded areas.
- .6 The re-use of stripped & stockpiled topsoil as substitute for screened surface topsoil (Section 32 91 21) is permitted in graded areas, provided the above-specified surface requirements are achieved.

3.8 Proof Rolling

- .1 For proof rolling, use fully loaded dual axle dump truck with an effective single axle load of 18,000 lbs (80 kN)
- .2 The Contract Administrator may accept use of other acceptable proof rolling equipment
- .3 Proof roll top of subgrade upon completion of compaction, fine grading work, and density testing to verify compliance with density and moisture specification
- .4 Make sufficient passes of proof roller to subject every point on the surface to three separate passes of loaded tire
- .5 Where proof rolling reveals areas of unstable subgrade, proceed as follows
 - .1 Investigate material in unstable area to required depth below subgrade elevation, or as directed by the Contract Administrator. If the material below the subgrade surface is deemed to be suitable, redo subgrade preparation to a depth necessary to achieve requirements of this section. After completion of rework, proof roll subgrade again
 - .2 If the investigation reveals unsuitable material, remove such material to the depth and extent as directed by the Contract Administrator. Use of geotextile and geogrid in the bottom of the excavation shall be at the discretion of the Contract Administrator
 - .3 Backfill area of excavation with common material in compliance with the compaction and moisture content requirements of this section. Proof roll subgrade again
 - .4 The use of Geosynthetic as a means to help correct areas of unstable subgrade shall be at the discretion of the Contract Administrator and shall only be used after all methods noted in this section have been attempted. Unaccepted use of geosynthetic shall be at the Contractors' expense

3.9 Maintenance

- .1 Maintain finished surfaces in a condition in accordance with this Section Part 3.6 Finishing and Tolerances until succeeding material is applied.
- .2 Acceptance of finished subgrade by the Contract Administrator does not relieve the Contractor of his responsibility to provide a subgrade meeting the requirements of this Section until succeeding material is applied.
- .3 Maintain work area such that dust does not create a safety hazard to the airport.

3.10 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal. Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 - GENERAL

1.1 Measurement for Payment

- .1 There will be no additional measurement for payment for work performed under this section. Pavement Surface Cleaning is incidental to the work carried out in other sections.

1.2 Related Sections

- .1 Section 02 41 13 – Asphalt Pavement Removal
- .2 Section 32 17 23 – Pavement Paint Markings

PART 2 - PRODUCTS

1.1 Materials

- .1 Abrasives and solvents used for removal of paint, oil, grease, rubber deposits: proprietary products specially designed for pavement cleaning, subject to approval by the Engineer/Owners Representative

PART 3 - EXECUTION

3.1 Pavement Surface Cleaning

- .1 Remove dust, contaminants, loose and foreign materials, oil and grease, in areas designated and by method approved by the Engineer/Owner Representative.
- .2 Use rotary power brooms supplemented by hand brooming.
- .3 The contractor shall maintain sufficient labourers and minimum one (1) functional Sweeper(s) for cleaning onsite.
- .4 The contractor shall ensure all pavement surfaces are clear of debris.
- .5 Pavement surface cleaning shall be completed daily, immediately prior to pavement paint marking applications, immediately prior to full demobilization, and as required by the resident engineer.

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for supply, producing and placing of the aggregate base course as indicated in the Contract Drawings

1.2 Related Sections

- .1 Section 31 05 17 – Aggregate Materials
- .2 Section 31 22 14 – Airfield Grading

1.3 Measurement Procedures

- .1 Regrading and compacting existing granular subbase and base material will be measured in square meters by surveyed area of actual work incorporated and accepted by the Engineer/Owner Representative. The price will include regrading, compacting, proof rolling and protecting the surface until the asphalt is placed
- .2 Granular subbase and base course will be measured in tonnes of material incorporated into the Work and accepted by the Engineer/Owner Representative.
- .3 No Payment shall be made for overbuild of Granular Subbase and Base Course beyond what is shown in the Contract Drawings. Nor will overbuilds be acceptable in the event excavation is completed beyond what is identified in the Contract Drawings
- .4 Payment at the tendered unit price shall be full compensation for the supply, processing, stockpiling, loading hauling, placing, applying moisture/water, compacting, maintaining, protecting, cleanup and other work incidental to this section.

1.4 References

- .1 American Society for Testing Materials (ASTM) – most recent edition of:
 - .1 ASTM C117, Standard Test Methods for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing
 - .2 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Sized Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - .3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
 - .4 ASTM D1557, Text Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³)
 - .5 ASTM D1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils
 - .6 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1 – [88], Sieves, Testing Woven Wire, Inch Series
 - .2 CAN/CGSB-8.2 – [M88], Sieves, Testing Woven Wire, Metric

1.5 Delivery, Storage and Handling

- .1 Deliver, handle, and stockpile aggregates in accordance with Section 31 05 17 – Aggregate Materials

PART 2 - PRODUCTS

2.1 Materials

- .1 Aggregate shall be in accordance with Section 31 05 17 – Aggregate Materials and the following requirements
 - .1 Crushed Gravel
 - .2 Gradation to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2, CAN.

Subbase Course gradations shall be in accordance with the 2020 British Columbia MoTI Standard Specifications for Highway Construction, Section 202 75 mm Select Granular Subbase:

Sieve Size	% Passing
100 mm	-
75 mm	95-100
50 mm	-
37.5 mm	-
25 mm	-
19 mm	35-100
12.5 mm	-
9.5 mm	-
6.3 mm	-
4.75 mm	-
2.36 mm	-
1.18 mm	-
0.60 mm	-
0.30 mm	3-15
0.075 mm	0-5

Base Course gradations shall be in accordance with the 2020 British Columbia MoTI Standard Specifications for Highway Construction, Section 202 25 mm Well-Graded Base:

Sieve Size	% Passing
100 mm	-
75 mm	-
50 mm	-
37.5 mm	-
25 mm	100
19 mm	80-100
12.5 mm	-
9.5 mm	50-85
6.3 mm	-
4.75 mm	35-70
2.36 mm	25-50
1.18 mm	15-35
0.60 mm	-
0.30 mm	5-20
0.075 mm	2-7

- .1 Liquid limit: n/a
- .2 Plasticity Index: n/a
- .3 Los Angeles degradation: to ASTM C131. Max % loss by weight: 30
- .4 Micro Deval Loss Factor (ASTM D6928): Max 25%
- .5 Sand Equivalent (ASTM D2419): Min 40
- .6 Flat and Elongated Particles using 4:1 ratio (ASTM D4791): Max 10%
- .7 Crushed particles (ASTM D5821): At least 60% of Particles by mass to have at least 2 freshly fractures faces

PART 3 - EXECUTION

3.1 Placement and Installation

- .1 Place granular base only after proof rolling has been accepted by the Engineer
- .2 Placing:
 - .1 Construct granular base to depth and grade in areas as indicated.
 - .2 Ensure no frozen material is placed. Hauling and placing material shall not take place in conditions below 0° C.
 - .3 Place material only on clean unfrozen surface, free from snow or ice.
 - .4 Begin spreading base material on crown line or on high side of a one-way slope.
 - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .6 For spreading and shaping material, use spreader boxes with adjustable temples or screeds which will place material in uniform layers of specified thickness.
 - .7 Place material to full width in uniform layers not exceeding 300 mm compacted thickness. Engineer/Owners Representative may authorize thicker lifts (layers) if specified compaction can be achieved. This should be demonstrated with a test strip.
 - .8 Shape each layer to smooth contour and compact specified density before the next layer is placed
 - .9 Remove and replace portion of layer in which material has become segregated during spreading.
 - .10 Spray and stabilize exposed granular base adjacent to runways and taxiways, with asphalt tack coat or alternative liquid dust control coat as directed by the Engineer/Owners Representative prior to reopening adjacent runways and taxiways.
 - .11 Apply prime coat on top of new granular base material prior to the application of hot mixed asphalt.

3.2 Compaction

- .1 Compaction equipment to be capable of obtaining required material densities
- .2 Compact to density not less than 98% Modified Proctor Maximum Dry Density. (ASTM D1557)
- .3 Shape and roll alternatively to obtain smooth, even and uniformly compacted base
- .4 Apply water as necessary during compaction to achieve the specified density

- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by the Engineer/Owners Representative
- .6 Correct surface irregularities by loosening, and adding or removing material until surface is within specified tolerance
- .7 For proof rolling, use a legally loaded dual axle truck with an effective single-axle load of 80 kN. Obtain acceptance from Engineer/Owners Representative to use non-standard proof rolling equipment
- .8 Proof roll at level in granular base course as indicated. If non-standard proof rolling equipment is accepted, the Engineer/Owners Representative shall determine level of proof rolling
- .9 Make sufficient passes with proof roller to subject every point on surface to three separate passes of load tire
- .10 When proof rolling reveals areas of defective subgrade:
 - .1 Remove base, sub-base, and subgrade material to depth and extent as directed by the Engineer/Owners Representative
 - .2 Backfill excavated subgrade as directed by the Engineer/Owners Representative
 - .3 Replace sub-base material and compact as directed by the Engineer/Owners Representative
 - .4 Replace base material and compact to specifications

3.3 Tolerances

- .1 Finished granular base surface to be within +/- 10 mm of established grades and cross section but not uniformly high or low
- .2 Correct surface irregularities greater than +/- 10 mm by adding or removing material until surface is within specified tolerances

3.4 Protection

- .1 Maintain finished base course in condition conforming to the specifications until succeeding materials are placed or until acceptance from the Engineer/Owners Representative
- .2 Acceptance of finished granular subbase and base course by the Engineer/Owners Representative does not relieve the Contractor of their responsibility to provide a finished granular subbase and base course meeting the specifications until the succeeding material is applied

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for the supply and application of asphalt tack coat as indicated by the Contract Documents or as directed by the Engineer

1.2 Section Includes

- .1 Materials and application of asphalt tack coat to an existing asphalt surface prior to asphalt paving

1.3 Related Sections

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 32 12 16 – Asphalt Paving

1.4 Measurement Procedures

- .1 Prime coats and tack coats shall be measured in squared metres of prime coat / tack coat applied to the future asphalt pavement area as shown on the Contract Drawings, based on surveyed areas submitted to the Engineer/Owner Representative

1.5 References

- .1 All references to this Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments
- .2 American Society for Testing and Material International, (ASTM)
 - .1 ASTM D140, Standard Practice for Sampling Bituminous Materials
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-16.2, Emulsified Asphalts, Anionic Type, for Road Purposes

1.6 Submittals

- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures
- .2 Sample asphalt tack coat material to ASTM D140
- .3 Provide access on tank truck for the Engineer to sample asphalt material to be incorporated into the Work, in accordance with ASTM D140
- .4 Provide one (1) 4 litre (L) sample of asphalt emulsion per 5,000 litres (L) of asphalt emulsion delivered, if requested by the Engineer

1.7 Quality Assurance

- .1 Upon request from the Engineer, submit manufacturer's test data and certification that asphalt tack coat material meets requirements of this Section

1.8 Delivery, Storage and Handling

- .1 Deliver, store, and handle materials in accordance with ASTM D140 and manufacturer's written instructions
- .2 Provide, maintain, and restore asphalt storage areas

1.9 Waste Management and Disposal

- .1 Separate waste materials for reuse and recycling in accordance with the Contract Documents
- .2 Divert unused asphalt from landfill to facility capable of recycling materials

PART 2 - PRODUCTS

2.1 Materials

- .1 Anionic emulsified asphalt: to CAN/CGSB-16.2, grade: SS-1
- .2 Water: clean, potable, free from foreign matter

2.2 Equipment

- .1 Pressure distributor to be:
 - .1 Designed, equipped, maintained and operated so that asphalt material can be:
 - .1 Maintained at even temperature
 - .2 Applied uniformly on variable widths of surface up to 5.0 m
 - .3 Applied at readily determined and controlled rates from 0.2 to 5.5 L/m² with uniform pressure, and with an allowable variation from any specified rate to exceeding 0.1 L/m²
 - .4 Distributed in uniform spray without atomization at temperature required
 - .2 Equipment with meter, registering meters of travel per minute, visibly located to enable truck driver to maintain constant speed required for application at specified rate
 - .3 Equipped with pump having flow meter graduated in units of 5.0 L or less per minute passing through nozzles and readily visible to operate. Pump power unit to be independent of truck power unit
 - .4 Equipped with an easily read, accurate, and sensitive device which registers temperature of liquid in reservoir
 - .5 Equipped with accurate volumes measuring device or calibrated tank
 - .6 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation
 - .7 Equipped with nozzle spray bar, with operational height adjustment
 - .8 Cleaned if previously used with incompatible asphalt materials

PART 3 - EXECUTION

3.1 Application

- .1 Obtained Engineer's approval of surface before applying asphalt tack coat
- .2 Apply asphalt tack coat only on clean and dry surface
- .3 Dilute asphalt emulsion with water at 1:1 ratio for application. Mix thoroughly by pumping or other methods accepted by the Engineer
- .4 Apply asphalt tack coat evenly to pavement surface at rate as directed by the engineer, at a rate not to exceed 0.5 L/m²
- .5 Paint contact surfaces of curbs, gutters, headers, manholes and similar structures with thin, uniform coat of asphalt tack coat materials
- .6 Do not apply asphalt tack coat when air temperature is less than 5 °C or when precipitation is forecasted within two (2) hours of application
- .7 Apply asphalt tack coat only to surfaces that are to be overlaid with asphalt on the same day
- .8 Apply asphalt tack coat only on unfrozen surface

- .9 Evenly distribute localized excessive deposits of tack coat by brooming as directed by the Engineer
- .10 When traffic is to be maintained, treat no more than one half of surface width in one application
- .11 Keep traffic off tacked areas until asphalt tack coat has set
- .12 Re-apply tack coat to contaminated or disturbed areas as directed by the Engineer
- .13 Permit asphalt tack coat to set before placing asphalt pavement

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for producing and placing Hot Mixed Asphalt Concrete (HMAC) to the lines, grades and dimensions shown in the Contract Documents or as directed by the Engineer/Owner Representative

1.2 Section Includes

- .1 Materials and installation for asphalt concrete paving for airside pavements including runways, taxiways, aprons and service roads

1.3 Related Sections

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 45 00 – Quality Control
- .3 Section 31 05 16 – Aggregate Materials
- .4 Section 32 12 13.16 – Asphalt Tack Coat
- .5 Section 32 01 12 – Pavement Surface Cleaning

1.4 Measurement for Payment

- .1 Hot Mix Asphalt Concrete (HMAC) Paving shall be measured in metric tonnes of HMAC placed and compacted to the designed thicknesses and elevations shown on the Contract Drawings, based on surveyed areas submitted to the Engineer/Owner Representative
- .2 No payment shall be made for overbuild of HMAC Paving beyond the neat lines shown in the Contract Drawings
- .3 Payment at the tendered unit price for HMAC Paving shall be full compensation for the mix design, production and supply of aggregates, polymer modified Performance Graded Asphalt Binder (PGAB), supply and incorporation of anti-stripping agent into the mix as required by mix design, production and transportation of hot mix asphaltic concrete mix, preparation of the surface to be paved including tack coat, saw cutting required for staggered paving areas and temporary paving ramps, temporary paving ramps if required, placement and compaction of the mixture, finishing, quality control plan, and testing, cleanup, and all other work, equipment, and materials, including supply of marshall samples and cores for quality assurance, cleanup, and all other work incidental to complete the work as specified in the Contract Documents
- .4 No separate payment shall be made for the supply and placement of asphalt prime or tack coat. The work is to be included in the prime and/or tack coat bid items, and shall not be included in the supply and placement of HMAC
- .5 No separate payment shall be made for saw cutting, cold joint construction or any associated works related to the placement of HMAC. The work is considered incidental to the supply and placement of HMAC.
- .6 No separate payment shall be made for HMAC lap joints. All work, materials, and equipment are considered incidental to the supply and placement of HMAC

1.5 References

- .1 All references to these specifications, standards, or methods shall be understood to refer to the latest adopted version, including all amendments
- .2 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO M320, Standard Specification for Performance Graded Asphalt Binder
 - .2 AASHTO R29, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder
 - .3 AASHTO T245, Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus
 - .4 AASHTO T283, Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage
 - .5 AASHTO T350, Standard Method of Test for Multiple Stress Creep Recovery (MSCR) Test of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
- .3 Asphalt Institute (AI)
 - .1 AI MS2, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types
- .4 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C117, Standard Test Method for Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing
 - .2 ASTM C127, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate
 - .3 ASTM C128, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate
 - .4 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - .5 ASTM C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates
 - .6 ASTM C1252, Standard Method for Un-compacted Void Content
 - .7 ASTM C207, Standard Specification for Hydrated Lime for Masonry Purposes
 - .8 ASTM D995, Standard Specification for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
 - .9 ASTM D2419, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
 - .10 ASTM D2041, Test Method for Theoretical Maximum Specific Gravity of Bituminous Paving Mixtures
 - .11 ASTM D2726, Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
 - .12 ASTM D3203, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
 - .13 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
 - .14 ASTM D6927, Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
 - .15 ASTM D 6928 Standard Test Method for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

- .16 ASTM D7428 Standard Test Method for Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
- .5 Canadian General Standards Board (CGSB)
 - .1 CAN /CGSB-8.2, Sieves Testing, Woven Wire, Metric
 - .2 CAN /CGSB-16.3, Asphalt Cements for Road Purposes

1.6 Samples

- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures
- .2 Submit asphalt concrete mix design and trial mix test results reviewed and signed by an AB Registered Professional Contract Administrator to the Engineer/Owners Representative for review at least two (2) weeks prior to beginning work. Prove optimum asphalt cement content with a minimum of five (5) points of curves relating asphalt cement content to density, stability, air voids, flow, voids in mineral aggregate (VMA), and voids filled with asphalt (VFA) versus asphalt cement content (% by weight of total mix).
- .3 Submit the following to the Engineer/Owner Representative at least two (2) weeks prior to starting paving operations
 - .1 Mix Design
 - .1 Mix Design by Marshall method, as outlined in the latest edition of the Asphalt Institute Manual (MS-2), including all laboratory testing results. Mix formulas only are not acceptable. A qualified and independent testing laboratory engaged by the Contractor shall be employed to prepare a mix design and job mix formulae
 - .2 Asphalt Cement
 - .1 Viscosity – temperature chart for asphalt cement to be supplied showing Kinematic Viscosity in centistokes (mm²/s), temperature range 105 to 175°C
 - .2 Proposed source of asphalt cement and manufacturers test data
 - .3 Submit up to five (5) – 1 L containers of asphalt cement, if requested by the Engineer/Owners Representative
 - .3 Aggregates
 - .1 Proposed source of aggregates
 - .2 Submit up to 50 kg samples of coarse and fine aggregates, if requested by the Contract Administrator
 - .3 Submit aggregate processing Quality Control test results
 - .4 Plant Scale Certificate
 - .1 Submit a copy of the plant scale certificate
 - .5 During paving operations submit the following samples as specified to the Engineer/Owners Representative
 - .1 Asphalt cement: One (1) – 1 litre container of asphalt cement per 2000 tonnes of asphalt placed, if requested by the Engineer/Owners Representative
 - .2 The Manufacture's test data and certification that the asphalt cement meets the requirements of this specification
 - .3 Printed temperature record of asphalt mix produced on a daily basis
 - .4 Weigh scale tickets recording mass of asphalt delivered and incorporated into the work on a daily basis

1.7 Paving Plan

- .1 The Contractor shall submit a paving plan at least two (2) weeks prior to commencing paving operations
- .2 This plan shall detail the following
 - .1 Proposed paving equipment
 - .2 A plan illustrating the sequence of asphalt paving and proposed mat joints, location of transverse and construction joints, and other information as requested by the Engineer/Owners Representative
 - .3 A contingency plan to deal with the interruption in asphalt concrete supply, breakdown in equipment and inclement weather during paving operations
 - .4 How joints will be heated during construction to limit the amount of cold joints
- .3 Acceptance of the plan by the Engineer/Owners Representative will not relieve the Contractor of any responsibility in attaining a defect free product

1.8 Quality Control Plan

- .1 Quality Control (QC) and all efforts related to QC testing is the responsibility of the Contractor
- .2 QC is defined as the sum total of activities performed by the HMAC producer and/or the Contractor to make sure that the HMAC product meets specification requirements. This includes materials handling and construction procedures, calibration and maintenance of equipment, production process control, and any sampling, testing, and inspection that is done for these purposes
- .3 The Contractor shall submit a QC Plan at least two (2) weeks prior to commencing paving operations
- .4 The Contractor's QC Plan shall contain appropriate information regarding the sampling and testing that will be performed by the Contractor's personnel. The sampling and testing plan should contain testing information which will be used by the Contractor to maintain control of the production and placement of the asphalt concrete and to ensure a product that complies with the specifications
- .5 The Contractor's QC Plan shall contain a detailed testing plan outlining the characteristic or quality to be inspected, the test method to be used, the frequency, the sampling location, and designation of responsibility. Every quality shall define the tolerances that are allowed or specified
- .6 QC reports shall be submitted daily to the Engineer/Owners Representative

1.9 Delivery, Storage and Handling

- .1 Deliver and stockpile aggregates in accordance with Section 31 05 17 – Aggregates Materials
- .2 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles
- .3 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted
- .4 Provide approved storage, heating tanks and pumping facilities for asphalt cement

PART 2 - PRODUCTS

2.1 Materials

- .1 Asphalt cement: Performance graded asphalt cement to AASHTO M320 and AASHTO T350, grade PG 58-28 polymer modified asphalt
- .2 Mix Type: Class 1 Medium Hot Mix as per British Columbia MoTI 2020 Standard Specification for Highway Construction, Section 502
- .3 Determine Tensile Strength (TSR) of each mix in accordance with AASHTO T283
- .4 Aggregate shall satisfy all requirements of Tables 1 and 2 of this specification and unless otherwise specified shall be:
 - .1 Crushed rock composed of hard, uncoated, cubical fragments, produced from rock formations or boulders of uniform quality
 - .2 Crushed gravel composed of hard, durable, uncoated particles, produced from naturally formed deposits
 - .3 Fine aggregates shall consist of natural sand and/or manufactured material derived from crushing stone, or gravel. Fine aggregate shall have a minimum 60% manufactures fines (passing the 4.75 mm sieve). All particles shall be clean, durable, sharp and free from coatings of clay, silt or other deleterious materials. Fine aggregates shall contain no organic matter
 - .4 Natural sand and/or blend sand shall be limited to 15% maximum of the aggregate blend
- .5 Physical Requirements of Aggregate Materials
 - .1 Physical requirements of aggregates shall be within limits shown on Table 2
 - .2 Contractor shall not use aggregates having known polishing characteristics in mixtures for surface courses
 - .3 Regardless of compliance with the physical requirements, aggregates may be accepted or rejected based on past field performance
- .6 Gradation of Aggregates Materials for paving
 - .1 Gradation of aggregates blended to job mix formula shall be within the limits shown in Table 1 when tested to ASTM C117 and ASTM C136 and giving smooth curve without sharp breaks when plotted on semi-log grading chart
 - .2 Coarse aggregate is retained on 5 mm sieve and fine aggregate is aggregate passing 5 mm sieve
 - .3 Contractor to process aggregate and stockpile fine aggregate separately from coarse aggregate
- .7 Mineral Filler
 - .1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non-plastic mineral matter, thoroughly dry and free from lumps
 - .2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed to improve mix properties
 - .3 Mineral filler to be dry and free flowing when added to aggregate
- .8 Blend Sand
 - .1 Screenings produced in crushing of quarried rock boulders, or gravel
 - .2 Add blend sand when necessary to meet job mix aggregate gradation or as directed, to improve mix properties
 - .3 Blend sand to be sufficiently dry to be free flowing when added to aggregate

Table 1 Percent Passing			
Sieve Size (mm)		New Limits	
Metric	Imperial	Base	Surface
20	19	100	-
16	16	80-95	100
12.5	12.5	67-85	82-95
10	9.5	58-78	70-85
5	4.75	40-60	50-65
2.5	2.36	27-47	35-50
1.25	1.18	18-37	23-40
0.630	0.600	12-30	15-30
0.315	0.300	8-23	10-23
0.160	0.150	5-15	6-16
0.080	0.075	3-8	3-8

Table 2 Physical Tests for Hot Mix Aggregate			
Physical Test	Fine Aggregate	Coarse Aggregate	Notes
Los Angeles Abrasion ASTM C131	-	25	
Gradation "B" Max % Loss	-	80	Surface Course
	-	70	Base Course
Percent Crushed Minimum	50	-	
Sand Equivalent ASTM D2419 Minimum	18	16	
Micro Deval ASTM D7428, % Loss	-	1.75	
Absorption ASTM C127 Max % by mass	-	1.5	Surface Course
Loss by Washing ASTM C117 Max % Passing Sieve	-	2.0	Base Course
	-	15	
Flat & Elongated Particles Tario greater than 5:1 Max % by Mass	45	-	Surface Course
Fine Aggregate Angularity – Uncompacted Void Content – Min %	25	-	
Liquid Limit ASTM D4318 – Maximum	0	-	
Plasticity Index ASTM D4318 – Maximum			

2.2 Equipment

- .1 Pavers: automatic grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated. Provide two pavers for echelon paving and one back-up paver of equal capability

- .2 Rollers: sufficient number, minimum of three per paver of type and weight to obtain specified density of compacted mix
- .3 Vibratory Rollers
 - .1 Minimum Drum Diameter shall be 1200 mm
- .4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
 - .1 Boxes with tight metal bottoms
 - .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded
 - .3 In cool weather or for long hauls, insulate entire contact area of each truck box
 - .4 Use only trucks which can be weighed in single operation on scales supplied
- .5 Hand Tools:
 - .1 Lutes or rakes with covered teeth for spreading and finishing operations
 - .2 Tamping irons with a mass of at least 12 kg and bearing area not exceeding 310 cm² for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by the Engineer/Client Representative, may be used instead of tamping irons
 - .3 Straight edges, 4.5 m in length, to test finished surface
- .6 Joint Heater:
 - .1 Apparatus connected to the paving equipment capable of keeping joints at 120°C or above until the next paving lane has been laid
 - .2 Where applicable in lower temperatures and accepted by the Engineer/Contract Administrator, restorative seal / emulsion products, such as CRF spray or accepted equivalent, may be proposed by Contractor as alternative.

2.3 Mix Design

- .1 Mix design to be provided and accepted by the Engineer/Contract Administrator
- .2 Mix design to be developed by testing laboratory accepted by the Engineer/Contract Administrator
- .3 Design of mix by Marshall Method as outlined in the latest edition of the Asphalt Institute Manual (MS-2), to the following specifications:
 - .1 Compaction blows on each face of test specimen – 75
 - .2 Mix physical requirements for Airfield Pavements in accordance to Class 1 Medium Hot Mix as per British Columbia MoTI 2020 Standard Specification for Highway Construction, Section 502
 - .3 Minimum asphalt cement content in the surface and base course asphalt mixes shall be as follows:
 - .1 Surface Course: 5.4% by weight of mix
 - .2 Base Course: 5.0% by weight of mix
 - .4 Contractor shall not change the job mix without prior acceptance of the Engineer/Contract Administrator. When change in material source is proposed, new job-mix formula is to be accepted by the Engineer/Contract Administrator

PART 3 – EXECUTION

3.1 Examination

- .1 Contractor shall verify that the conditions of substrate previously installed under other sections or contracts are acceptable for asphalt paving
 - .1 Inform the Engineer of unacceptable conditions immediately upon discovery
 - .2 Proceed with installation only after unacceptable conditions have been rectified and approval to process has been received from the Engineer/Contract Administrator

3.2 Plant and Mixing Requirements

- .1 Batch and continuous mixing plants:
 - .1 To ASTM D995
 - .2 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders. Do not load frozen materials into bins
 - .3 Feed cold aggregates to plant in proportions to ensure continuous operations
 - .4 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved
 - .5 Before mixing, dry aggregates to moisture content not greater than 0.5% by mass or to lesser moisture content if required to meet mix design requirements
 - .6 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.
 - .7 Store hot screened aggregates in manner to minimize segregation and temperature loss
 - .8 Heat asphalt cement and aggregate to mixing temperature of 140°C or as otherwise directed by Contract Administrator. Do not heat asphalt cement above 160°C, maximum temperature indicated on temperature-viscosity chart. All asphalt load temperatures to be tested with infrared thermometer upon arrival.
 - .9 Contractor to make available current asphalt cement viscosity data at plant. With information relative to viscosity of asphalt being used, the Contract Administrator to approve temperature of completed mix at plant and at paver after considering hauling and placing conditions
 - .10 Maintain temperature of materials within 5°C of specified mix temperature during mixing
 - .11 Mixing time:
 - .1 In batch plants, both dry and wet mixing times for not less than 10 seconds. Continue wet mixing as long as necessary to obtain thoroughly blended mix but not less than 30 s or more than 75 s
 - .2 In continuous mixing plants, mixing time as directed by the Engineer/Contract Administrator but not less than 45 s
 - .3 Do not alter mixing time unless directed by the Engineer/Contract Administrator
- .2 Dryer drum mixing plant
 - .1 To ASTM D995 standard

- .2 Load aggregates from individual stockpiles to separate cold feed bins. Do not load frozen materials into bins
- .3 Feed aggregates to burner end of dryer drum by means of multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin
- .4 Meter total flow of aggregate by an electronic weigh belt system with indicator that can be monitored by plant operator and which is interlocked with asphalt pump so that proportions of aggregate and asphalt entering mixer remain constant
- .5 Provide for easy calibration of weighing systems for aggregates without having material enter mixer
- .6 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved. Calibrate weigh bridge on charging conveyor by weighing amount of aggregate passing over weigh bridge in set amount of time. Difference between this value and amount shown by plant computer system to differ by not more than plus or minus 2%.
- .7 Make provision for conveniently sampling full flow of materials from cold feed
- .8 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate from cold feed prior to entering drum
- .9 Provide system interlock stop on feed components if either asphalt or aggregate from bin stops flowing
- .10 Accomplish heating and mixing of asphalt mix in approved parallel flow dryer-mixer in which aggregate enters drum at burner end and travels parallel to flame and exhaust gas stream. Control heating to prevent fracture of aggregate or excessive oxidation of asphalt. Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with printing recorder that can be monitored by plant operator. Submit printed record of mix temperatures at end of each day to the Engineer/Contract Administrator
- .11 Mixing period and temperature to produce uniform mixture in which particles are thoroughly coated, and moisture content of material as it leaves mixer to be less than 1%.
- .3 Temporary Storage of hot mix
 - .1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation
 - .2 Do not store asphalt mix in storage bins in excess of 3 hours
- .4 While producing asphalt mix for this Project, do not produce mix for other users unless separate storage and pumping facilities are provided for materials supplied to this project
- .5 Mixing tolerances
 - .1 Permissible variation in aggregate gradation from job mix (percent of total mass)

Metric Sieve Designations (mm)	% Passing by Mass	
	Individual Sample	Average of Last 10 Samples
>5	± 5.0	± 3.0
5	± 5.0	± 3.0
2.5	± 4.0	± 2.5
0.63	± 3.0	± 2.0
0.315	± 3.0	± 2.0
0.160	± 2.0	± 1.5
.080	± 1.5	± 1.0

- .2 Asphalt Content Tolerance: Allowable variation from accepted design asphalt content shall be ± 0.3 % by mass of mix
- .3 Air Void Content Tolerance: Allowable variation from accepted design air void content shall be ± 1.0 %
- .4 Mixing Temperature Tolerance: Allowable variation from design mixing temperature shall be $\pm 5^{\circ}\text{C}$
- .6 Addition of anti-stripping agent, if required, shall only be of liquid anti-strip additive accepted by the Engineer/Contract Administrator

3.3 Preparation

- .1 When paving over existing asphalt surface, clean pavement surface. When levelling course is not required, patch and correct depressions and other irregularities to approval of the Contract Administrator before beginning paving operations
- .2 Apply prime coat and tack coat in accordance with Section 32 12 13.23 – Asphalt Prime and Section 32 12 13.16 – Asphalt Tack Coats prior to paving
- .3 Prior to laying mix, clean surfaces of loose and foreign material

3.4 Transportation of Mix

- .1 Transport mix to job site in vehicles cleaned of foreign material
- .2 Paint or spray truck beds with limewater, soap or detergent solution, or non-petroleum based commercial product, at least daily or as required. Elevate truck bed and thoroughly drain. No excess solution to remain in truck bed
- .3 Schedule delivery of material for placing in daylight, unless the Engineer approves artificial lighting for paving
- .4 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation. Do not dribble mix into trucks
- .5 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment
- .6 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within range of $140^{\circ}\text{C} \pm 5^{\circ}\text{C}$ or otherwise directed by Engineer. All asphalt load temperatures to be tested with infrared thermometer upon arrival.

3.5 Placing

- .1 Obtain Engineer/Contract Administrator acceptance of prime and tack coat prior to placing asphalt
- .2 Set up string lines and place asphalt concrete to thicknesses, grades and lines as indicated in the contract drawings or as directed by the Engineer/Contract Administrator.
- .3 The compacted thickness of asphalt concrete shall be as specified in the Contract Drawings or as directed by the Engineer/Contract Administrator
- .4 Placing Conditions

- .1 Place asphalt mixtures only when air temperature is at least 5°C and rising
- .2 When temperature of surface on which material is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling
- .3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved or during periods of precipitation
- .5 Place asphalt concrete in compacted lifts of thickness as indicated in the Contract Drawings
- .6 On airport runways, taxiways and aprons, commence spreading at high side of pavement or at crown
- .7 Where possible, do tapering and leveling where required in lower lifts. Overlap joints and existing longitudinal cracks by not less than 250 mm
- .8 Spread and strike off mixture with self-propelled mechanical finisher
 - .1 Construct longitudinal joints and edges true to line markings
 - .1 Establish lines for paver to follow parallel to centreline of proposed pavement. Position and operate paver to follow established line closely
 - .2 When using pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by the first paver
 - .1 Work pavers as close together as possible and in no case permit them to be more than 30 m apart
 - .3 Maintain constant head of mix I auger chamber of paver during placing
 - .4 If segregation occurs, immediately suspend spreading operations until cause is determined and corrected
 - .5 Correct irregularities in alignment left by paver by trimming directly behind machine
 - .6 Correct irregularities in surface of pavement course directly behind paver
 - .1 Remove excess material forming high spots using a shovel or lute
 - .1 Fill and smooth indented areas with hot mix
 - .2 Do not broadcast material over such areas
 - .7 Do not throw surplus material on freshly screeded surfaces
- .9 When hand spreading is necessary:
 - .1 Use approved wood or steel forms, rigidly supported to assure correct grade and cross section/fall
 - .1 Use measuring blocks and intermediate strips to aid in obtaining required cross section
 - .2 Distribute material uniformly without broad casting material
 - .3 During spreading operations, thoroughly loosen and uniformly distribute materials by lutes or covered rakes
 - .1 Reject material that has formed into lumps and does not break readily
- .4 After placing and before rolling, check surface with templates and straightedges and correct irregularities
- .5 Provide heating equipment to keep hand tools free from asphalt
 - .1 Control temperature to avoid burning material

3.6 Compacting

- .1 Compact HMAC to a minimum average degree of compaction of 98% when comparing the in-situ density to the measured 75 Blow Marshall briquette density for the mix, with no single measured location less than 95%.

3.7 Joints

- .1 General:
 - .1 Remove surplus material from surface of previously laid strip
 - .1 Do not deposit on surface of freshly laid strip
 - .2 Construct joints between asphalt concrete pavement and Portland cement concrete pavements as indicated
 - .3 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement
- .2 Transverse Joints
 - .1 Offset transverse joint in succeeding lifts by at least 3 m
 - .2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving
 - .3 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints
- .3 Longitudinal Joints
 - .1 Offset longitudinal joints in succeeding lifts by at least 150 mm
 - .2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 90°C prior to paving of adjacent lane
 - .1 For airfield runway paving, avoid cold joint construction wherever possible with special attention paid to the mid-30 m of runway
 - .2 If cold joint cannot be avoided, cut back by saw cutting previously laid lane, by at least 150 mm, to full depth vertical face, clean to provide sludge-free edge and tack face with thin coat of hot asphalt of adjacent lane
 - .3 Overlap previously laid strip with spreader by 50 mm
- .4 Construct butt joints as indicated

3.8 Finish Tolerances

- .1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low
- .2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction
- .3 Finished asphalt surface to provide positive drainage without ponding water

3.9 Defective Work

- .1 Correct irregularities that develop before completion of rolling, by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density
- .2 Repair areas showing checking, rippling, or segregation. All repair methods to be submitted to the Engineer for acceptance
- .3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement
- .4 Asphalt pavement not meeting the specified compaction, thickness or finish tolerances shall be subject to removal and replacement, at the Contractor's expense, as directed by the Engineer
- .5 Skin patches or other thin layer repairs or surface treatments are not acceptable repair methods for final asphalt surfaces

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for the supply and application of pavement paint markings indicated by the Contract Documents or as directed by the Engineer

1.2 Related Sections

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 32 01 11 – Pavement Surface Cleaning

1.3 References

- .1 All references to this Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments
- .2 CGSB1-GP-12c, Standard Paint Colours
- .3 CGSB1-GP-71, Method of Testing Paints and Pigments
- .4 Workplace Hazardous Materials Information System (WHMIS) – Material Safety Data Sheets (MSDS)

1.4 Submittals

- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures
- .2 Submit paint manufacturer's product data and one (1) 3.78 litre of each colour and paint type at least 3 weeks prior to commencing work

1.5 Measurement for Payment

- .1 Pavement paint markings will be measured in lump sum including the supply, installation of two (2) coats of paint, protection, and clean up
- .2 If required, temporary pavement paint markings shall not be measured or paid for separately, as this work is considered incidental to this and the PCO Sections of the Contract

PART 2 - PRODUCTS

2.1 Materials

- .1 Permanent Paint Markings
 - .1 Must adhere to Federal Standard TTP-1952E Type II or Type III, low acrylic waterborne airfield paint marking
- .2 Colours must adhere to Federal Standard 595B:
 - .1 Colour White - 37925
 - .2 Colour Yellow - 33538
 - .3 Colour Black - 37038
 - .4 Colour Green - 34108
 - .5 Colour Red - 31136
- .3 Submit paint manufacturer's product data and one (1) 3.78 litre of each colour and paint type at least 3 weeks prior to commencing work

PART 3 - EXECUTION

3.1 Examination

- .1 Contractor is responsible for verifying the conditions of substrates and surfaces to receive pavement paint markings
- .2 Pavement surfaces shall be clean and dry during the application of pavement markings. Pavement surfaces to be painted shall be clean, free from curing compounds, standing water, frost, ice, dust, oil, grease, rubber deposits and any other foreign matter
- .3 Proceed with Work only after unacceptable conditions have been rectified

3.2 Equipment Requirements

- .1 Paint applicator shall be an approved pressure type distributor capable of applying pavement paint markings in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated on the contract documents. Equipment must have a positive shut-off.
- .2 All equipment for use in this Work shall be approved by the Engineer and shall include a mechanical marking machine and such auxiliary hand painting equipment as may be necessary to satisfactorily complete the Work.
- .3 The mechanical marker shall be an approved atomizing spray-type marking machine suitable for the application of traffic paint. It shall produce an even and uniform film thickness at the required coverage, and shall be designed so as to apply markings of uniform cross section and clear-cut edges without running or spattering.
- .4 Suitable adjustments shall be provided on the sprayer(s) of a single machine or by furnishing additional equipment for painting the required width

3.3 Application

- .1 The Contractor is responsible for surveying the markings required to complete the work. Survey methods for setting out the markings shall be in a manner that is acceptable to the Engineer
- .2 New asphalt pavements shall be permitted to cure for 30 days prior to the final application of pavement paint markings. When the line markings are painted prior to the required curing period, the second or final coat shall be provided at no extra cost
- .3 All pavement paint markings require 2 (two) separate coats of paint
- .4 The Contractor shall use stencils for painting letters and numbers
- .5 Unless otherwise accepted by the Engineer, apply pavement paint markings only when air temperature is above 10°C and when wind speed will not cause over spray. Paint markings shall not be applied when precipitation is forecasted within the next 4 (four) hours
- .6 Apply pavement paint markings uniformly at a rate of not less than 0.37 L/m² per single coat of paint
- .7 Apply the second coat of paint after the first coat has dried or after a minimum of one hour
- .8 Apply pavement paint markings to the locations and dimensions indicated in the Contract Documents or as directed by the Engineer
- .9 Do not thin paint unless approved by the Engineer
- .10 Symbols and letters to conform to dimensions indicated
- .11 Paint lines to be uniform colour and density with clean sharp edges
- .12 Thoroughly clean distributor tank before refilling with paint of different colour

3.4 - Tolerance

- .1 Pavement paint marking must be within 1 cm of the dimensions indicated in the Contract Documents
- .2 There shall be no overlap between the first and second coat of paint markings. Both coats of paint shall be at the same width and alignment
- .3 Paint Markings that have been applied that are not in accordance with the Contract Documents shall be removed in accordance with Section 32 01 11 – Pavement Surface Cleaning

3.5 - Protection of Completed Work

- .1 Contractor to protect pavement paint markings until dry

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for the placement and grading of topsoil as shown in the Contract Documents or as directed by the Engineer

1.2 Related Sections

- .1 Section 31 22 14 – Airfield Grading
- .2 Section 32 92 21 – Hydraulic Seeding

1.3 Measurement and Payment

- .1 Supplying, placing, and grading of imported topsoil will be measured in square meters without the adjustment for slopes. The rate includes the preparation of grade, screening topsoil, hauling/importing topsoil, placing, spreading, and fine grading of the topsoil off the edges of the pavement areas as indicated in the Contract Documents. The rate also includes the supply and application of soil amendments, including fertilizer and soil analysis and restoration of stockpile as directed by the Engineer.
- .2 The placement of topsoil for the purposes of site restorations required outside of designated work areas (access roads/haul routes) where the existing site was disturbed by the Contractor during construction will not be measured and is considered incidental to other items of work being performed.

1.4 Scheduling

- .1 The Contractor shall seed at the time best suited to permit proper germination

PART 2 - PRODUCTS

1.1 Materials

- .1 Imported topsoil shall be friable loam, neither heavy clay nor very light sandy nature, containing a minimum of 4% organic matter for clay loam, and 2% for sandy loam, to a maximum 20% by volume
- .2 Containing no toxic elements or growth inhibiting materials
- .3 Free from debris, subsoil, vegetation, and stones and roots over 2.5 cm (1") in diameter. Free from any man-made materials including metal, glass, plastic or asphalt.
- .4 Water shall be potable, free of impurities that would inhibit germination
- .5 The re-use of stripped & stockpiled topsoil as substitute for screened surface topsoil described herein is permitted in graded areas, provided all surface requirements described herein are achieved.

PART 3- EXECUTION

3.1 Preparation of Existing Grade

- .1 Verify the grades are correct and if discrepancies occur, notify the Engineer and do not commence work until instructed by the Engineer
- .2 Grade soil, eliminate uneven areas, low spots, high spots, and ensure positive drainage

- .3 Remove debris, roots, branches, stones or other deleterious materials in excess of 2.5 cm diameter. Remove soils contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surfaces. Dispose of removed materials off-site
- .4 Cultivate the entire area which is to receive topsoil to a minimum of 10 cm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil
- .5 Obtain Engineer's approval of finished grade before starting to place topsoil

3.2 Placing Topsoil

- .1 Topsoil shall not be placed in an excessively wet or frozen condition. Or in any manner in which the structure is adversely affected
- .2 Spread topsoil in uniform layers with a minimum depth of 75 mm, over unfrozen subgrade free of standing water
- .3 Ensure topsoil is placed to finished grade
- .4 Fine grade topsoil to lines and elevations as indicated in the Contract Documents, leaving material surface smooth and uniform with fine loose texture
- .5 Grade to eliminate rough spots and low area and ensure positive drainage. Prepare loose friable bed by cultivating and raking.
- .6 Pavement edges, drainage structures, and electrical fixtures shall be flush with surface topsoil, with no vertical edges or lips exceeding 50 mm (2"). surface and resistant to future erosion.

3.3 Surplus Materials

- .1 Dispose of excess material not required off site or as directed by the Engineer

3.4 Acceptance

- .1 Obtain Engineer's approval of topsoil grade and depth prior to applying seeding

END OF SECTION

PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for supply, transport and applying seed by the hydraulic method
- .2 The Contractor is responsible for applying hydroseed on all finished areas, including ditches, as well as areas not located on the site but disturbed during construction, that are not to be paved, sodded, or armoured.

1.2 Related Sections

- .1 Section 31 22 14 – Airfield Grading
- .2 Section 32 91 21 – Topsoil Placement and Grading

1.3 Measurement Procedures

- .1 Hydraulic seeding to restore shoulder areas of the runway and taxiways will be measured in square meters of area on plan, without adjustment for slopes. Price will include the supply, transportation, placement, fertilizing, watering, and maintenance during construction through until the end of the warranty period.

1.4 Product Data

- .1 Submit product data in accordance with Section 01 33 00 Submittal Procedures
- .2 Provide product data for:
 - .1 Seed
 - .2 Mulch
 - .3 Tackifier
- .3 Submit in writing to the Engineer/Contract Administrator five (5) days prior to commencing hydraulic seeding
 - .1 Capacity of hydraulic seeder in liters (L)
 - .2 Quantity of material to be used per tank based on volume
 - .3 Number of tank loads required per hectare to apply specified slurry mixture per hectare

1.5 Scheduling

Schedule hydraulic seeding to coincide with the preparation of soil surface and following the acceptance of the topsoil placement by the Engineer/Contract Administrator

PART 2 - PRODUCTS

2.1 Seed

- .1 "Canada pedigreed grade" in accordance with the Government of Canada Seeds Act and Regulations
- .2 Grass mixture, "Certified No. 1 common" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations"
 - .1 Mixture composition:
 - .1 30% Canada Bluegrass
 - .2 45% Creeping Red Fescue
 - .3 15% Timothy
 - .4 10% Annual Rye

2.2 Mulch

- .1 Specifically manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with the following properties:
 - .1 Type 1 mulch:
 - .1 Made from wood cellulose fiber
 - .2 Organic matter content of at least 95%
 - .3 pH value: 6.0
 - .4 Potential water absorption: 900%

2.3 Tackifier

- .1 Water dilutable. Liquid dispersion

2.4 Water

- .1 Free of impurities that would inhibit germination and growth

2.5 Fertilizer

- .1 To Canada's "Fertilizer Act" and "Fertilizers Regulation"
- .2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form

2.6 Inoculants

- .1 Inoculant containers to be tagged with expiry date

PART 3 - EXECUTION

3.1 Workmanship

- .1 Do not spray onto any structures, signs, fences, airfield lighting infrastructure, fences, plant materials, utilities and other surfaces that are not intended to have hydroseed
- .2 If an unintended area is sprayed, the contractor shall immediately clean-up all materials
- .3 Do not perform work under adverse environmental conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water
- .4 Protect seeded areas from trespass until vegetation is established

3.2 Preparation of Surfaces

- .1 Fine grade areas to be seeded, as to be free of undulations, humps, bumps, and hollows. Ensure areas are free of deleterious and refuse materials
- .2 Cultivated areas identified as requiring cultivations to depth of 25 mm
- .3 Ensure areas to be seeded are moist to a depth of 100 mm before seeding
- .4 Obtain Engineer/Owner Representative inspection of grade and topsoil depth before starting to hydraulic seed

3.3 Fertilizing Program

- .1 Fertilize prior to fine grading incorporating fertilizer equally distributed in accordance with the following:
 - .1 400 kg per hectare one week before seeding
 - .2 400 kg per hectare to be applied with seed mix

3.4 Preparation of Slurry

- .1 Measure quantities of materials by weight or weight-calibrated volume measurement. Supply equipment required for this work
- .2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder
- .3 After all other material is in the seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry

3.5 Slurry Application

- .1 Hydraulic Seeding equipment:
 - .1 Slurry tank
 - .2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method
 - .3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles
- .2 Slurry mixture applied per hectare
 - .1 Seed: Grass mixture 300 kg
 - .2 Mulch: Type 1 – 1,700 kg
 - .3 Tackifier: As recommended by manufacturer
 - .4 Water: As required
 - .5 Fertilizer: 400 kg
- .3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed
 - .1 Using correct nozzle for application
 - .2 Using hoses for surfaces difficult to reach and to control applications
- .4 Blend application 300 mm into adjacent grass areas or sodded areas to form a uniform surface

- .5 Re-apply slurry application where it is non-uniform
- .6 Clean/remove slurry from items and areas not designated to be sprayed
- .7 Protect seeded areas from trespass until vegetation growth is established
- .8 Remove protective equipment/temporary fences when seeded areas are established

3.6 Establishment

- .1 Perform the following operations from time of seed application until final acceptance by the Engineer/Owner Representative
 - .1 Water seeded areas as required to maintain optimum soil moisture levels and to ensure germination and continued growth of grass. Control watering to prevent washouts
 - .2 Fertilize seeded areas one month after seeding. Spread evenly and water. Use at rate determined by soil test. If application falls within a four-week period prior to expected end of local growing season, postpone fertilizer until the following spring.
 - .3 Repair dead or bare spots to allow establishment of seed prior to acceptance
 - .4 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices

3.7 Acceptance

- .1 Seeded areas will be accepted by the Engineer/Owners Representative provided:
 - .1 Plants are uniformly established and seeded areas are free of rutted, eroded, bare, or dead spots
 - .2 Areas have been mowed at least twice and no bare spots remain
 - .3 Areas have been fertilized as specified

END OF SECTION