

DEPARTMENT OF NATIONAL DEFENCE



SPECIFICATION

ASPHALT PAVEMENT REPAIRS

2016 14 WING GREENWOOD,

GREENWOOD, NS

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Job # L-G111-9302/201 - J439

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- 1 Site Visit
- .1 Before submitting a Tender, the Contractor shall visit the site and acquaint himself/herself with all ascertainable conditions that may affect the work.
 - .2 Consult with Engineer or Engineer's representative regarding services available, material accommodations the Contractor may require, access to the site and obtain any and all information that may affect the Contractor's Tender.
- 2 Location of Site
- .1 Canadian Forces Base 14 Wing Greenwood is located 150 km west of Halifax and 4 km south of Highway 101 near Kingston, Kings County, NS.
 - .2 Camp Aldershot is located 50 km east of Canadian Forces Base Greenwood and 5 km north of Highway 101 near Kentville, Kings County, NS.
 - .3 Middleton Armouries is located 12 km west of Canadian Forces Base Greenwood and 2 km south of Highway 101 near Middleton, Annapolis County, NS.
- 3 Description of Work
- .1 Work under this contract comprises the provision of all labour, material and equipment required to complete the work in accordance with the specifications for this project.
 - .2 Work of this Contract is located in an area where normal working hours are:
 - .1 0730 to 1600 hours, Monday to Friday inclusive.
 - .3 Specified work is to be carried out at the following location:
 - .1 Operations Area, Domestic Area, Married Quarter Area, the Runways and Taxi-ways at 14 Wing Greenwood, Camp Aldershot and Middleton Armouries in the Province of NS.
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3 Description of
Work
(Cont'd)

- .3 (Cont'd)
- .2 14 Wing Greenwood is also responsible for maintaining a site on Stronach Mountain ASR Tower, Brickton Beacon near Middleton, Parker Road Beacon near Aylesford, Cloud Lake Air Cadet Camp, Granville Rifle Range near Annapolis Royal, Barrington Radar Tower Site and the Yarmouth Armouries. Requests for work at these sites will require quotes and Engineer's approval prior to any Work being performed.
- .4 In general terms, the work includes the following:
- .1 Old asphalt removal and disposal.
 - .2 Common excavation, removal and disposal.
 - .3 Placing hot mixed asphalt complete with tack/coat and compaction by hand method.
 - .4 Placing hot mixed asphalt complete with tack/prime coat and compaction by spreader method.
 - .5 Placing Portland Cement Concrete Curbing complete with form work.
 - .6 Placing Hot Mixed Asphalt curbing complete with tack coat.
 - .7 Placing granular base courses (Class A gravel) complete with compaction to specified densities.
 - .8 Placing granular sub-base courses (Class B or C gravel) complete with compaction to specified densities.
 - .9 Scarifying, grading, placing granular materials (Class A), sweeping pavements and compacting road shoulders.
 - .10 Raising existing manholes, catch basins, water valve boxes and appurtenances effected by changing grades due to placement of Asphalt
 - .11 Placing form lumber for sidewalks.
 - .12 Placing topsoil.
 - .13 Placing sod.
 - .14 Repainting of pavement markings disturbed as a result of Work performed.
 - .15 Milling of asphalt surfaces.
 - .16 Milling of Portland Cement Concrete surfaces.
 - .17 Sawcutting of asphalt surfaces.

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- 1 Description of Work .1 The Work under this Contract comprises the furnishing of all necessary requirements for the completion of the Work as specified and/or shown in the following specification sections.
- 2 References .1 National Building Code of Canada (NBC) 1995 including all amendments up to tender closing date.
- 3 Codes .1 Perform work in accordance with the National Building Code (NBC) and National Fire Code (NFC) and/or any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements will govern.
- .2 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.
- .3 References made to Domestic, national and International standards in this specification are to be considered an integral part thereof and to be read in conjunction with those specifications.
- .4 Obtain all written information from the described sources for references made to catalogues, detailed drawings or similar related data as published by Manufacturers and /or suppliers.
- .5 Trade names used in this specification are not necessarily restrictive unless specifically noted.
- .6 Workmanship to be of a uniformly high quality and in strict accordance with the best trade practices as interpreted by the Engineer.
- .7 Mediocre or inferior workmanship to be replaced by work of first class quality without cost to DND when so ordered by Engineer.
- .8 Conform to latest revisions and amendments of dated reference standards and be fully familiar with their contents and requirements.
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- 3 Codes
(Cont'd)
- .9 In the event of conflict in standards the most stringent standard to apply.
- 4 Documents
Required
- .1 Maintain at job site, one copy each of following:
.1 Specifications.
.2 Addenda.
.3 Change orders.
.4 Other modifications to Contract.
.5 Copy of approved work schedule.
.6 Manufacturers' installation and application instructions.
.7 Standards listed in Part 1 of Specification Sections under Reference Standards.
- 5 Work Schedule
- .1 Prior to Work commencement, the Contractor to arrange for an on-site meeting with the Engineer, to program starting dates, work schedules, and contract procedures for performing the work of this Contract.
- .2 Interim reviews of work progress based on work schedule and Requisitions against the Standing Offer will be conducted as decided by Engineer.
- .3 When Work schedule on Requisitions against the Standing Offer Agreement has been approved by Engineer take necessary measures to complete work within scheduled time.
- .4 Do not change schedules without Engineer's approval.
- 6 Briefing
Requirements
- .1 Receive briefing from Wing Security Officer regarding Wing Security Regulations and restrictions.
- .2 Receive briefing from Wing Fire Chief regarding Wing Fire Safety Regulations and restrictions.
- .3 Receive briefing from Wing Air Traffic Control Officer regarding aircraft safety, travel to and across restricted areas and radio communications.
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- 6 Briefing Requirements (Cont'd)
- .3 (Cont'd)
.1 Contractor to have at job site, a VHF/FM Trans-Rec, tuned to 149.150 megacycles with an output of not more than 25 watts.
- 7 Contractor's Use of Site
- .1 General: Work of this Contract may be in areas either partially or wholly occupied by private and/or government staff and equipment. Contractor to employ necessary precautions to protect these personnel and equipment from hazards, damage or contamination.
- .2 Contractor to be briefed on use of site by Engineer.
- .3 Use of site: for execution of work and storage of materials only. Any other use of site by Contractor is not permitted.
- .4 Do not unreasonably encumber site with materials or equipment.
- .5 Move Contractor stored products or equipment which interfere with operations of occupants, Engineer or other contractors when directed by Engineer. Movement to and around site to be subject to restrictions imposed by Wing Commander.
- .6 Obtain and pay for use of additional storage needed for operations.
- 8 Project Meetings
- .1 Engineer to arrange project meetings and assume responsibility for setting times and recording and distributing minutes.
- 9 Setting Out of Work
- .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations/grades indicated.
- .2 Provide devices needed to lay out and construct work.
- .3 Supply such devices as straight edges and templates required to facilitate Engineer's inspection of work.
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- 10 Cutting, and Patching
- .1 Execute cutting (including excavation), fitting and patching required to make work fit properly.
 - .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
 - .3 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- 11 Existing Services
- .1 Submit schedule to and obtain approval from Engineer for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
 - .2 Where unknown services are encountered, immediately advise Engineer and confirm findings in writing.
- 12 Alterations, Additions or Repairs to Operations Facilities
- .1 Execute work with least possible interference or disturbance to operational facilities. Arrange with Engineer to facilitate execution of work.
 - .2 Provide temporary dust screens, covers, barriers, warning signs and any other safety, damage or contamination prevention devices required in locations where work is located in or adjacent to areas used by DND personnel.
 - .3 In the event that the work of this Contract affects Wing operations and /or equipment, Contractor is responsible for notification to Engineer, prior to any Work being preformed.
- 13 Additional Drawings
- .1 Engineer may furnish additional drawings to assist proper execution of work. These drawings will be issued for clarification only. Such drawings shall have same meaning and intent as if they were included with plans referred to in Contract documents.
- 14 Sanitary Facilities
- .1 Provide sanitary facilities in accordance with governing regulations and ordinances.
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15 Building Smoking .1 Comply with smoking restrictions.

Environment

- 16 Temporary Facilities
- .1 DND can provide, free of charge, temporary electric power and water for construction purposes.
 - .2 Engineer to determine delivery points and quantitative limits. Engineer's written permission is required before any connection is made. Connect to existing power supply in accordance with Canadian Electrical Code.
 - .3 Provide at no cost to DND, all equipment and temporary lines to bring these services to project site.
 - .4 Supply of temporary services to Contractor is subject to DND requirements and may be discontinued by DND site representative at any time without notice, without acceptance of any liability for damage or delay caused by such withdrawal of temporary services.
 - .5 Remove temporary facilities from site when directed by Engineer.

- 17 Delivery and Storage
- .1 Provide secure temporary storage facilities for materials and equipment.
 - .2 Deliver, store and maintain materials with manufacture's labels and seals intact.
 - .3 Store materials in accordance with supplier's instructions and 14 Wing Standing Orders. Wing HAZMAT Co-ordinator Ext 5792 Mr A Pearson to approve storage and proper labelling of containers for items to be stored on DND sites.
 - .4 Storage to be in areas with Engineer's approval and stored in a manner not detrimental to contaminating the Environment in the event of spills. Contractor to provide sufficient spill control materials at storage site in event of spills for materials being stored.

- 17 Delivery and Storage (Cont'd)
- .5 Provide and maintain dry storage. Items such as drums containing liquid asphalt to have secondary containment as part of their storage requirements. Storage to be in the area approved by Engineer.
 - .6 Maintain storage facilities premises in a neat and tidy condition at all times.
 - .7 Remove storage when directed by Engineer and soonest on completion of Work to be performed on the Standing Offer Agreement.
 - .8 Storage site subject to inspection by Wing Hazmat co-ordinator. All observations of improper storage to be rectified soonest to the direction of the Hazmat co-ordinator or Contractor's storage areas will not be permitted on DND property.
- 17 Airport Requirements
- .9 Do not disrupt airport operations except as permitted by Engineer.
 - .10 Provide barricades and lights as directed.
 - .11 Active Areas: In areas of airport not closed to aircraft traffic:
 - .1 Obtain Engineer's approval on scheduling of work.
 - .2 Control movement of equipment and personnel as directed by Engineer.
 - .3 Provide competent flagperson at locations designated by Engineer to relay signals from airport traffic control tower to equipment and personnel wishing to cross live traffic areas.
 - .4 Signals from airport traffic control tower to be obeyed instantly.
 - .12 Unserviceable Areas: Mark off areas made unserviceable for aircraft by work of this Contract by providing plainly visible danger markings by day and red lights by night. Open flames and inflammable fuels not permitted.
 - .13 Park equipment not in use and stockpile materials so that their tops are below a 50 to 1 ratio from ends of usable landing strip and below 20 to 1 ratio from sides of aircraft traffic areas. Where directed, mark tops with red lights.

1 Related Requirements Specified Elsewhere

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Engineer are specified under various sections.

2 Appointment and Payment

- .1 The Contractor is responsible for quality **control**.
Contractor to appoint and pay for testing laboratory services for testing and inspection as required by the Contractor to ensure the quality of Work meets the specified requirements including the following:
.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
.2 Inspection and testing performed exclusively for Contractor's convenience and quality control.
.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
.4 Mill tests and certificates of compliance.
.5 Tests specified to be carried out by Contractor under the supervision of Engineer.
.6 Additional tests specified in paragraph 2.2.
- .2 The Engineer may choose to carry out some random testing to verify the quality of the Contractor's Work at any time during or after the Work has been completed. Engineer to appoint and pay for this testing only.
- .3 Where tests or inspections by the laboratory appointed by Engineer reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Engineer may require to verify acceptability of corrected work.

3 Contractor's Responsibilities

- .1 Furnish labour and facilities to:
.1 Provide access to work to be inspected and tested.
.2 Facilitate inspections and tests.
.3 Make good work disturbed by inspection and test.
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3 Contractor's
Responsibilities
(Cont'd)

- .2 Notify Engineer sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, and if decided by Engineer to test proposed materials deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Engineer.

1 Construction
Safety Measures

- .1 Observe construction safety measures required by Canadian Labour Code, Provincial Government Regulations, Workers' Compensation Board and municipal statutes and authorities.
- .2 In event of conflict or discrepancy between any provisions of above authorities, Engineer will approve direction as to which requirements shall govern.
- .3 The Contractor to comply with all standing orders or other regulations in force on the site where work is to performed.
- .4 Contractor created hazards to be marked with warning signs and barriers.
- .5 All protective devices, barriers, boarding and the like to be maintained in good order until completion of the work under this contract, or until removal is ordered by the Engineer.
- .6 Supply and erect signs and warning devices as specified in Part D, Signs and Devices of manual titled Uniform Traffic Control Guide of Canada distributed by Roads and Transportation Association of Canada.
- .7 Place signs and other devices in locations as recommended by said manual and/or where directed by Engineer.
- .8 Meet with Engineer prior to commencement of Work to prepare list of signs and other devices required to perform Work.
- .9 Continually maintain traffic control devices in use by:
 - .1 Checking signs daily for legibility, damage, suitability and location installed. Clean, repair or replace to ensure clarity and reflectance are maintained.
 - .2 Remove or cover signs which do not apply to conditions existing from day to day.

2. Protection

- .1 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, fences and adjacent property.
 - .2 Work areas to be cleaned up daily.
 - .3 Removed materials to be disposed of daily.
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- 1 Construction
Safety Measures
(Cont'd)
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- .4 Keep vehicular traffic off newly repaired areas until pavement or installations have set or cured to within standard requirements.
 - .5 Comply with requirements of Acts, Regulations and By-laws in force for regulation of traffic or use of any roadway upon or over which it is necessary to carry out work or haul materials or equipment.
 - .6 When working on a travelled way:
 - .1 Place equipment in such a position as to prevent a minimum of interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.as possible
 - .3 Do not leave equipment on travelled way overnight.
 - .4 Contractor is responsible for the security of Equipment and is at no times to leave the vehicle while the equipment is operating or engine running.
 - .7 Do not close any lanes of traffic without approval of Engineer. Prior to re-routing traffic erect suitable signage and devices to Engineer's approval.
 - .8 Provide means of temporary detours around construction work in a manner authorized and approved by Engineer. Surfaces to be maintained to ensure a smooth riding surface.
 - .9 Provide flagman and traffic control devices in accordance with Provincial regulations and Nova Scotia safety Council recommendations.

PART 1 - GENERAL

- 1.1 Fire Department Briefing .1 Engineer will coordinate arrangements for the contractor to be briefed on Fire Safety at their pre-work conference by Fire Chief before any work is commenced.
- 1.2 Reporting Fires .1 Know the location of nearest fire alarm box and telephone, including the emergency phone number.
- .2 Report immediately all fire incidents to the Fire Department as follows:
.1 activate nearest fire alarm box; or
.2 telephone.
- .3 Person activating fire alarm box will remain at the box to direct Fire Department to scene of fire.
- .4 When reporting a fire by telephone, give location of fire, name or number of building and be prepared to verify the location.
- 1.3 Fire Extinguishers .1 Supply fire extinguishers, as scaled by Fire Chief, necessary to protect, the work in progress and the contractors physical plant on site.
- 1.4 Blockage of Roadways .1 Advise Fire Chief of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by fire chief, erecting of barricades and the digging of trenches.
- 1.5 Smoking Precautions .1 Observe at all times smoking regulations.
- 1.6 Rubbish and Waste Materials .1 Rubbish and waste materials are to be kept to minimum.
- .2 The burning of rubbish is prohibited.
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1.6 Rubbish and
Waste Materials
(Cont'd)

- .3 Removal:
 - .1 Remove all rubbish from the work site at the end of the work day or shift or as directed.
- .4 Storage:
 - .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
 - .2 Deposit greasy or oily rags and materials subject to spontaneous combustion in an approved receptacles and remove as required in 1.8.3.1.

1.7 Flammable and
Combustible Liquids

- .1 The handling, storage and use of flammable and combustible liquids are to be governed by the current National Fire Code of Canada.
 - .2 Flammable and combustible liquids such as gasoline, kerosene and naphtha will be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes, requires the permission of the Fire Chief.
 - .3 Transfer of flammable and combustible liquids is prohibited within buildings or jetties.
 - .4 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.
 - .5 Flammable liquids having a flash point below 38°C such as naphtha or gasoline will not be used as solvents or cleaning agents.
 - .6 Flammable and combustible waste liquids, for disposal, will be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and the Fire Department is to be notified when disposal is required.
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1.8 Questions
and/or
Clarification

- .1 Direct any questions or clarification on Fire Safety in addition to above requirements to Fire Chief.

1.9 Fire
Inspection

- .1 Site inspections by Fire Chief will be coordinated through Engineer.
- .2 Allow Fire Chief unrestricted access to the work site.
- .3 Co-operate with the Fire Chief during routine fire safety inspection of the work site.
- .4 Immediately remedy all unsafe fire situations observed by the Fire Chief.

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- 1 General
- .1 Contractors and their personnel to read and be familiar with this section and its requirements.
 - .2 Contractor to post, in a noticeable location on job site, the following names and emergency telephone numbers:
 - .1 14 Wing Greenwood:
 - .1 Wing Fire Chief (WFC) - Local 5473.
 - .2 Engineer's delegated representative Local 1531.
 - .3 911.
 - .3 Work with hazardous materials to be done by workers who are thoroughly educated to the risks and handling procedures involved with the material and are trained in safe work practices.
 - .4 Encounters with material suspected of being hazardous and not previously identified are to be reported to Engineer immediately, and work in this area of project halted until direction is received from Engineer.
 - .5 Contractors are to comply with regulations and procedures or Federal, Provincial and local area environmental protection agency when dealing with hazardous materials.
 - .6 Inquiries regarding Hazardous Materials can be directed to Engineer.
- 2 Reference Standards
- .1 NFC-1995 - National Fire Code of Canada 1995.
 - .2 CLC-Part IV - Canada Labour Code.
 - .3 WHMIS - Workplace Hazardous Materials Information System (Federal Legislation Bill C-70).
 - .4 Hazardous Products Act.
 - .5 Hazardous Materials Information Review Act.
 - .6 Occupational Health and Safety Regulations.
 - .7 Regulations and standards currently in force for products not covered under WHMIS legislation, designed for the regulation of specific categories of products such as but not limited to:
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- 2 Reference Standards (Cont'd) .7 (Cont'd)
- .1 Explosives Act.
 - .2 Atomic Energy Control Act.
 - .3 Pest Control Products Act.
- 3 Documentation .1 Where Contractor supplied materials or chemicals are of a hazardous nature, provide Engineer with two copies of Material Safety Data Sheet (MSDS) for each hazardous product.
- .1 Hazardous products that do not have a Material Safety Data Sheet are not permitted on DND property.
 - .2 Information (MSDS) on known or suspected hazardous materials on site can be obtained through Engineer from the Hazardous Materials Coordinator.
- 4 Signs and Notices .1 Contractor to make available a copy of the Material Safety Data Sheet for each product on site, for the information of site workers and visitors to the site.
- .1 Site workers to familiarize themselves with the Material Safety Data Sheet for each product.
 - .2 Signs and/or notices for safety and instruction to be in both official languages, or commonly understood WHMIS symbols, and to be posted in prominent locations around area of work.
- 5 Worker Safety .1 Workers involved with hazardous materials on jobsite to be equipped with all necessary personal protective equipment (PPE) required by Labour Canada and/or Provincial Labour Department.
- 6 Indemnity .1 Contractor accepts liability and indemnifies the Department of National Defence and its employees in the event of injury or damage resulting from the use of or exposure to hazardous materials.
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- 7 Compliance .1 In event of conflict between the requirements referred to throughout this section and in paragraph 2 - Reference Standards, the more stringent requirement to govern.
- 8 Delivery and Storage .1 In addition to requirements of Section 01005 General Instructions, deliver and store hazardous materials to the following:
.1 Incompatible substances and chemicals to be kept segregated at all times.
.2 Contractor can obtain clarification and identification of subject substances and chemicals through Engineer from Base Hazardous Materials Coordinator.
- 9 Spills and Leaks .1 Notify Wing Fire Department and Engineer at 14 Wing CFB Greenwood immediately in the event of a spill or leak. Wing Fire Chief will coordinate and direct clean-up.
.2 Prevent injury to personnel until responsible authorities arrive and implement procedures necessary to contain and secure spill area.
.3 Spills and leaks resulting from Contractor neglect or mishandling to be cleaned up at Contractor's expense.
- 10 Clean-up .1 Additional requirements to Section 01710 - Cleaning are listed below:
.1 All hazardous material waste to be stored in containers as recommended by manufacturer of hazardous material and removed from site at end of each work day.
.2 Disposal of waste material to be in accordance with the Department of the Environment regulations and to be off DND property at approved dump sites for materials to be disposed off.

- 1 Fires .1 Fires and burning of rubbish on site not permitted.
- 2 Disposal of Wastes .1 Do not bury rubbish and waste materials on site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Disposal of wastes to be at approved dump sites for intended materials.
- 3 Pollution Control .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authorities emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures when directed by Engineer.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust.
- .5 Remove rubbish from site daily to prevent blowing debris.
- .6 Provide dust control for temporary and permanent access and haul routes, located near airfield, within base, or near residential areas.
- .7 Prevent silt from entering watercourses and/or drainage structures. Provide silt screens when directed by Engineer.
- .8 Provide silt and erosion control devices in accordance with Nova Scotia Department of Environments "Handbook for Construction Sites" and as determined by Engineer.
- 4.0 Equipment & Fueling .1 All Equipment to be used on site to be inspected by Engineer to ascertain condition of equipment in regards to petroleum product leakage. Equipment not in good repair to be refused on site until leaks have been repaired
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to the satisfaction of Engineer.

- .2 Refueling of equipment to be performed in a location approved by Engineer, and to be a minimum of 30 metres from a watercourse or storm drainage inlet such as a catch basin grating.
 - .3 Refueling to be performed on a hardstand where possible and on ground that is uniformly level in grade.
 - .4 Contractor to report all petroleum spills regardless of size to Engineer and Wing Environment Office. Spills exceeding 75 litres to be reported to the Provincial Department of Environment through Engineer.
 - .5 Contractor to maintain on site a spill control kit being a minimum of a shovel, a 45 gallon container, and absorbent materials of sufficient quantities for the petroleum products being used by the equipment on site. Quantities to be determined by Wing Hazmat Co-ordinator Mr A Pearson at Ext 5792.
 - .6 Contractor to receive briefing by Wing Hazmat Co-ordinator in regards to spills on work sites.
 - .7 Contractor is responsible to pay costs for spill clean-ups.
 - .8 Contractor to perform clean-ups soonest and as directed by Engineer.
 - .9 Equipment parked overnight or on DND property to to be parked in location as directed by Engineer and to have metal drip pans secured in place & placed beneath equipment to protect against petroleum products contaminating the soils. Protection provided to be to Engineer's approval.
 - .10 Contractor storage of petroleum products to be in location and manner as approved by Wing Hazmat Co-ordinator containers properly marked in accordance with WHMIS legislation. Wing Hazmat Co-ordinator to provide direction in briefing to Contractor.
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3 Pollution Control .11 Petroleum products stored on DND property to
 (Cont'd)

be removed immediately on completion of the
Work of a Project.

1 References

- .1 Nova Scotia Provincial Department of
Environment's "Handbook for Construction
Sites" most recent edition.

1 Refueling

- .1 Refueling of equipment at 14 Wing Greenwood to be performed in locations as directed by Engineer.
 - .2 Do not refuel equipment within 30 metres of any watercourse or storm water catch basin unless protection against spills is in place and location is approved by Engineer.
 - .3 Use petroleum containers approved for products with no spill fill spouts for dispensing fuels. The sure pour nozzle to have self closing valve, prevent any flow of fuel until the nozzle is inserted into the receiving container. On removal from the receiving container the slide valve closes to eliminate any fuel spill. Nozzle to be equipped with its own automatic vent eliminating the need for the user to open or close air inlets on the pouring container.
 - .4 Nozzle to support the weight of the pouring container. Nozzles to automatically stop the flow when the receiving container becomes full. The nozzle to be such that it reduces evaporative losses of volatile organic compounds during the fuel transfer.
 - .5 All spills of hydrocarbon based products such as gasoline, kerosene, naptha, lubricating oils, engine oils, greases and de-icing fluids or antifreeze no matter how large or small to be reported to Engineer.
 - .6 Oil changes in the field or on DND land are not permitted.
 - .7 Refueling to be performed on level surfaces, PCC Portland cement concrete or HMA surfaces when approved by the Engineer unless otherwise directed.
 - .8 Contractor to have drip pans sized for amounts of product to be recovered and customized to fit under pieces of equipment to perform maintenance to equipment while maintaining equipment on property. Drip Pans to be used whenever leaving equipment on site or parking overnight when not in use.
 - .9 Parking of equipment on site to be on level ground in locations approved by Engineer. Equipment with leaks to be removed from site when so ordered by Engineer.
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2 Spill Control
Kits

- .1 Contractor to have at the work site a spill control kit consisting of the following minimum types of equipment:
- .1 a spaded shovel;
 - .2 a stable broom;
 - .3 a broad nosed shovel;
 - .4 a container(s) suitable, compatible to and of sufficient size to contain petroleum products being used with equipment;
 - .5 Absorbents;
 - .6 rags;
 - .7 metal container for soiled rags;
 - .8 Booms when working next to a watercourse that will traverse the width of the watercourse by two times; and
 - .9 Spill control kit to be inspected and approved by Wing Environment Office prior to Work commencing. Spill control kits to be available to Contractor employees at all areas where Work of the Contract is being performed and at all times during the course of the Contract.
 - .10 Contractor employees to be trained in the use of the spill control kit and the equipment they contain.

3 Spills

- .1 Disposal of spilled materials to be off DND property and at approve locations for materials to be disposed of.
- .2 When parking of equipment on site, the equipment is to be secured from entry, inspected for leaks and the ground protected from leaks.
- .3 Contractor to protect all wells, catch basins, drywells, drains and watercourses from contamination in event of a spill.
- .4 All equipment to be used for the Work of the Contract to be inspected by the Engineer for leaks. Equipment not in good repair to be removed/repaired when directed by Engineer.
- .5 Spills in excess of 74 litres to be reported immediately to the Wing Environment Officer and the Nova Scotia Provincial Department of the Environment.
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3 Spills
(Cont'd)

- .6 For spills occurring the Contractor to immediately remove as much or all of the contaminated soils created by the spill from Work of the Contractor as possible.
- .7 Contaminated soils/materials to be placed in containers compatible to the contaminants.
- .8 Any remaining clean-up to be performed at no extra cost to DND. Clean-ups to be to the Engineer's satisfaction.

1 References

- .1 Uniform Traffic Control Devices for Canada, (UTCD) January 1976 (distributed by Transportation Association of Canada).

2 Protection of Public Traffic

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out work or haul materials or equipment.
- .2 When working on travelled way:
.1 Place equipment in position to present minimum of interference and hazard to travelling public.
.2 Keep equipment units as close together as working conditions will permit and preferably on same side of travelled way.
.3 Do not leave equipment on travelled way overnight.
- .3 Do not close any lanes of road or highway without approval of Engineer. Before re-routing traffic erect suitable signs and devices in accordance with instructions contained in Part D of UTCD.
- .4 Keep travelled way well graded, free of pot holes and of sufficient width that required number of lanes of traffic may pass.
.1 Provide minimum 7 m wide temporary roadway for traffic in two-way sections through work and on detours.
.2 Provide minimum 5 m wide temporary roadway for traffic in one-way sections through work and on detours.
- .5 As indicated, or if directed by Engineer, provide gravelled detours or temporary roads to facilitate passage of traffic around restricted construction area.

3 Informational and Warning Devices

- .1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from project work which may require road user response.

4 Control of Public Traffic
(Cont'd)

- .1 (Cont'd)
- .8 Delays to public traffic due to contractor's operators not to exceed 15 min.

5 Operational Requirements

- .1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified herein and approved by Engineer to protect and control public traffic, existing conditions may be restricted.
- .2 Maintain existing conditions for traffic crossing right-of-way containing work.
- .3 Maintain existing conditions for traffic crossing right-of-way containing work except that, when required for construction under this Contract and when measures have been taken as specified herein and approved by Engineer to protect and control public traffic, existing conditions for cross traffic may be restricted.

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- 1 General .1 Use new material and equipment unless otherwise specified.
- .2 Within 7 days of written request by Engineer, submit following information for materials and equipment proposed for supply:
- .1 name and address of manufacturer,
 - .2 trade name, model and catalogue number,
 - .3 performance, descriptive and test data,
 - .4 manufacturer's installation or application instructions,
 - .5 evidence of arrangements to procure.
- .3 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.
- 2 Manufacturers Instructions .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify Engineer in writing of any conflict between these specifications and manufacturers instructions. Engineer will designate which document is to be followed.
- 3 Conformance .1 When material or equipment is specified by standard or performance specifications, upon request of Engineer, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1 General

- .1 Conduct cleaning and disposal operations daily and to comply with local ordinances and anti-pollution laws.
- .2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .3 At all times be extremely cautious that no debris or other hazardous impediments are left lying in locations that cause unsafe conditions.
- .4 On completion of the Work of this contract all materials, equipment and debris to be left clean, neat and in a safe condition to the complete satisfaction of the Engineer.

2 Materials

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

3 Cleaning During Work

- .1 Provide on-site containers for collection of materials, and debris daily and resulting from Work of this Contract.
 - .1 On-site containers to be equipped with secure lids to prevent debris from being wind carried.
- .2 Contractor to be responsible for preventing FOD (Foreign Object Damage) from debris resulting from work of this contract. This is terminology used in an Airport environment and pertains to debris being wind carried and/or deposited on active runways and taxiways within the Aerodrome.
- .3 Dispose of waste materials and debris when directed by Engineer and at approved dump site for material to be disposed of off DND property.
- .4 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

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- 3 Cleaning During Work (Cont'd) .5 Contractor to ensure that clean-up of debris resulting from milling work is completed daily and to the satisfaction of the Engineer.
- 4 Final Cleaning .1 Clean lighting reflectors, lenses, and other lighting surfaces contaminated by the Work being completed under this contract.
- .2 Broom clean paved surfaces; rake clean other surfaces of grounds. Contractor to be vigilant in clean-up of debris from millings.
- .3 Advise Engineer on completion of each clean-up.

PART 1 - GENERAL

- 1.1 Protection .1 Protect existing items designated to remain and materials designated for salvage. In event of damage, immediately replace such items or make repairs to approval of Engineer and at no additional cost to Engineer.
- .2 Protect surrounding surfaces from damage due to work of this section. Make good such damage to satisfaction of Engineer and at no additional cost.
- 1.2 Environmental Conditions .1 Provide adequate nuisance dust protection masks and ear protection to operator.
- .2 Provide adequate ventilation adjacent to work area.
- 1.3 Concrete Cutting .1 Contractor to cut asphalt concrete where required using jackhammer unless approved otherwise by Engineer.
- .2 Conduct cutting operations during periods scheduled by Engineer to reduce noise to Building and MQ occupants.
- 1.4 Contractor's Responsibilities .1 Furnish labour and facilities to:
- .1 Provide access to work requiring cutting.
 - .2 Make good work disturbed by Cutting.
 - .3 Provide storage on site for cutting specialists equipment and tools.

PART 2 - PRODUCTS

- 2.1 Equipment .1 Impact hammers: lightweight not exceeding 23 kg in mass. If powered by compressed air use air line oil trap.
- .2 Arrange with Engineer when required for provision of water and electricity for use during wet-cutting operations are required.
-

PART 3 - EXECUTION

- 3.1 Preparation
- .1 Inspect site and verify with Engineer items designated for removal and items to be preserved for each area of Work.
 - .2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.
 - .3 Notify utility companies before starting demolition.
 - .4 Do not commence work until all electrical and mechanical services likely to be encountered in the process of the cut have been identified and disconnected.
 - .5 Define exactly, outline of area to be cut and removed, and mark with indelible lines. All quantities and thicknesses to be determined with and provided to Engineer in writing.
 - .6 Advise Engineer prior to commencing cutting.
 - .7 Engineer to approve areas, quantities, thicknesses and type of cutting method to be used or identified prior to any cutting.
- 3.2 Removals
- .1 Remove items identified in scope and as required to carry out work of this contract.
 - .2 Do not disturb adjacent items designated to remain in place.
- 3.3 Cutting, General
- .1 Cut to depth required for repair.
 - .2 Cut surfaces to be smooth, plane and parallel unless otherwise specified.
 - .3 Remove all debris and clean surfaces of loose material.
 - .4 Where complete section cannot be removed by cutting or milling alone, use light jackhammering or other chipping tools to avoid damaging surrounding areas and loss of bond in remaining concrete.
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- 3.3 Cutting,
General
(Cont'd) .5 Remove all asphaltic concrete required to perform work specified and as approved by Engineer.
- 3.4 Disposal of
Material .1 Dispose of materials not designated for salvage or re-use in work, at approved locations for materials to be disposed of, off DND property.
- 3.5 Restoration .1 Upon completion of work, remove debris, trim surfaces and leave work site clean.
- .2 Reinststate areas and existing works outside areas of demolition disturbed as a result of this contract to conditions that existed prior to commencement of work.

PART 1 - GENERAL

- 1.1 Definitions
- .1 Rock excavation: excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders or rock fragments having individual volume in excess of 1 m³.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation including dense tills, hardpan, frozen materials and partially cemented materials which can be ripped and excavated with heavy construction equipment.
 - .3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- 1.2 Protection of Existing Features
- .1 Existing buried utilities and structures:
 - .1 Engineer to process CE Work Clearance Request for each site in accordance with CE Standard Operating Procedures prior to commencement of any work of this contract.
 - .2 Contractor to maintain copies of the approved clearance request on site during work of this contract.
 - .3 Prior to commencing any excavation work, notify applicable owner or authorities, establish location and state of use of buried utilities and structures. Clearly mark such locations to prevent disturbance during work.
 - .4 Confirm locations of buried utilities by careful hand excavated test holes.
 - .5 Maintain and protect from damage, water, sewer, electric, telephone and other utilities and structures encountered. Obtain direction of Engineer before moving or otherwise disturbing utilities or structures.
 - .6 Advise Engineer to re-route existing lines in area of excavation. Costs for such work will be paid by Engineer.
 - .7 Record location of maintained, re-routed and abandoned underground lines to Section 01720 - Project Record Documents.
 - .2 Existing buildings and surface features:
-

1.2 Protection of Existing Features (Cont'd)

- .2 (Cont'd)
- .1 Conduct, with Engineer, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.
- .2 Protect existing buildings and surface features which may be affected by work from damage while work is in progress and repair damage resulting from work.
- .3 Where excavation necessitates root or branch cutting, do so only as approved by Engineer.

1.3 Shoring, Bracing and Underpinning

- .1 Comply with Section 01545 - Safety Requirements and applicable local regulations and to protect existing features.
- .2 Engage services of qualified professional engineer who is registered in Canada province or territory in which work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for work.
- .3 At least 1 week prior to commencing work, submit design and supporting data.
- .4 Design and supporting data submitted to bear the stamp and signature of qualified professional engineer registered in Canada in the Province of Nova Scotia.
- .5 Professional engineer responsible for design of temporary structures to submit proof of insurance coverage for professional liability except where engineer is employee of contractor, in which case contractor shall submit proof that work by professional engineer is included in contractor's insurance coverage.

1.4 Inspection

- .1 Immediately following Contract award and prior to commencing work, inform Engineer of proposed source of fill materials and provide access for inspection and sampling.
-

PART 2 - PRODUCTS

2.1 Fill Materials

- .1 Type 1 fill:
.1 Class "A" gravel to Nova Scotia
Department of Transportation Specification
dated January 1980 (revised March 1, 1991),
Division 3, Section 6.

<u>Sieve Designation</u>	<u>% Passing</u>
20 000	100
14 000	50-85
5 000	20-50
160	0-10
80	0-7

- .2 Type 2 fill:
.1 Class "C" gravel to Nova Scotia
Department of Transportation Specification
dated January 1980 (revised January 4, 1990),
Division 3, Section 4.

<u>Sieve Designation</u>	<u>% Passing</u>
56 000	100
28 000	60-80
5 000	25-45
160	0-10

- .3 Type 3 fill:
.1 Selected material from excavation
approved by Engineer for use intended,
unfrozen and free from rocks larger than 75
mm, cinders, ashes, sods, refuse or other
deleterious materials.
- .4 Type 4 fill:
.1 Selected material from an excavation
outside the project parameters, approved by
Engineer for use intended, unfrozen and free
from rocks larger than 75 mm, cinders, ashes,
sods, refuse or other deleterious materials.
Material to be practically free from silt or
clay with 50% passing a 14 000 sieve.

2.2 Bedding and
Surround Material

- .1 Granular material to following requirements:
 - .1 Crushed or screened stone, gravel or sand consisting of hard durable particles free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
 - .2 Gradations to be within limits specified when tested to ASTM C 136-95a and ASTM C 117-95. Sieve sizes to CAN/CGSB-8.1-88.

<u>Sieve Designation</u>	<u>% Passing</u>
12.5 mm	100
9.5 mm	-
4.75 mm	80-100
2.00 mm	50-90
0.425 mm	10-50
0.180 mm	-
0.075 mm	0-10

PART 3 - EXECUTION

3.1 Site
Preparation

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 Stripping of
Topsoil

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
- .2 Commence topsoil stripping of areas as indicated as directed by Engineer after area has been cleared of brush weeds and grasses and removed from site.
- .3 Strip topsoil to depths as indicated as directed by Engineer. Avoid mixing topsoil with subsoil.
- .4 Stockpile in locations as indicated directed by Engineer. Stockpile height not to exceed 2 m.
- .5 Dispose of unused topsoil to location as indicated as directed by Engineer off site.

- 3.3 Stockpiling
- .1 Stockpile fill materials in areas designated by Engineer. Stockpile granular materials in manner to prevent segregation.
 - .2 Protect fill materials from contamination.
- 3.4 Cofferdams, Shoring, Bracing and Underpinning
- .1 Construct temporary works to depths, heights and locations as indicated or directed by Engineer approved by Engineer.
 - .2 During backfill operation:
 - .1 Unless otherwise indicated or directed by Engineer Consultant, remove sheeting and shoring from excavations.
 - .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
 - .3 Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least 500 mm above toe of sheeting.
 - .3 When sheeting is required to remain in place, cut off tops at elevations indicated or directed by Engineer Consultant.
 - .4 Upon completion of substructure construction:
 - .1 Remove cofferdams, shoring and bracing.
 - .2 Remove excess materials from site and restore water courses to conditions indicated or as directed by Engineer Consultant.
 - .5 Obtain permit from authority having jurisdiction for temporary diversion of water course.
- 3.5 Dewatering
- .1 Keep excavations free of water while work is in progress.
 - .2 Protect open excavations against flooding and damage due to surface run-off.
 - .3 Dispose of water in a manner not detrimental to public and private property, or any portion of work completed or under construction.
 - .4 Submit for Engineer's review approval details of proposed dewatering methods, such as dikes or well points.
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3.5 Dewatering
(Cont'd)

- .5 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

3.6 Excavation

- .1 Advise Engineering advance of excavation operations to enable original cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions indicated as directed by Engineer.
- .3 Remove concrete masonry paving walks demolished foundations and rubble and other obstructions encountered during excavation.
- .4 Excavation must not interfere with normal 45° splay of bearing from bottom of any footing.
- .5 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw. Seal cuts with approved tree wound dressing.
- .6 For trench excavation, unless otherwise authorized by Engineer in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .7 Dispose of surplus and unsuitable excavated material in approved location on site off site.
- .8 Do not obstruct flow of surface drainage or natural watercourses.
- .9 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .10 Notify Engineer when soil at bottom of excavation appears unsuitable and proceed as directed by Engineer.
- .11 Obtain Engineer approval of completed excavation.
- .12 Remove unsuitable material from trench bottom to extent and depth directed by Engineer.

3.6 Excavation
(Cont'd)

- .13 Where required due to unauthorized over-excavation, correct as follows:
- .1 Fill under bearing surfaces and footings with concrete specified for footings fill concrete.
 - .2 Fill under other areas with Type 2 fill compacted to minimum of 95% in accordance with Section - 02501 - Corrected Maximum Dry Density.
- .14 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Engineer.

3.7 Fill Types and
Compaction

- .1 Use fill of types as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698-91 ASTM D 1557-91.
- .1 Exterior side of perimeter walls: Use Type 3 fill to subgrade level. Compact to 95% in accordance with Section 02501 - Corrected Maximum Dry Density.
 - .2 Within building area: use Type 2 to underside of base course for floor slabs. Compact to 98% in accordance with Section 02501 - Corrected Maximum Dry Density.
 - .3 Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill topped with shearmat filler as indicated to underside of slab. Compact base course to 100% in accordance with Section 02501 - Corrected Maximum Dry Density.
 - .4 Retaining walls: use Type 2 fill to subgrade level on high side for minimum 500 mm from wall and compact to 95% in accordance with Section 02501 - Corrected Maximum Dry Density. Use Type 3 fill compacted to 95% in accordance with Section 02501 - Corrected Maximum Dry Density.
 - .5 Underground services:
 - .1 Install bedding and surround materials.

3.7 Fill Types and
Compaction
(Cont'd)

- .1 (Cont'd)
- .5 (Cont'd)
 - .2 Sanitary and storm sewer pipe and conduit protective cover: cradle half diameter of pipe or conduit using 150 mm depth of Type 1 fill. After pipe or conduit is in place, cover with 300 mm depth of Type 1 fill.
 - .3 Cable and cable duct bedding and immediate protective cover: cover bottom of trench with 150 mm of Type 1 fill. After cables and ducts are in place, side fill ducts with sand up to top of ducts. Tamp around ducts with hand tampers and cover to level of treated planking with 150 mm of same material.
 - .4 Fill above protective cover: in areas within buildings and where paving and walks occur, fill remainder of trench with Type 1 fill. In other areas, fill to subgrade level using Type 3 fill.
 - .5 Compaction: compact bedding and immediate protective cover to 80% minimum density. In areas within buildings and where paving and walks occur, compact remainder of fill to at least 95% density. In other areas compact remainder of fill to at least 85% density.
 - .6 Notify Engineer 3 days prior to backfilling of trenches for electrical services.

3.8 Backfilling

- .1 Do not proceed with backfilling operations until Engineer has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Backfilling around installations.
 - .1 Place bedding and surround material as specified.
 - .2 Do not backfill around or over cast-in-place concrete within 24 h after placing.
 - .3 Place layers simultaneously on both sides of installed work to equalize loading. Difference not to exceed 1 m.

- 3.8 Backfilling (Cont'd)
- .4 (Cont'd)
- .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
- .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Engineer:
- .2 If approved by Engineer erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Engineer.
- .5 Place material by hand under, around and over installations until 300 mm of cover is provided. Dumping material directly on installations will not be permitted.
- .5 Install drainage filter system in backfill as directed by Engineer.
- .6 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- 3.9 Inspection and Testing
- .1 Testing of materials and compaction will be carried out by testing laboratory designated by Engineer. Frequency of tests will be determined by Engineer.
- .2 Engineer will pay costs for inspection and testing in accordance with Section 01410 - Testing Laboratory Services.
- 3.10 Restoration
- .1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects noted by Engineer.
- .2 Replace topsoil as directed by Engineer.
- .3 Reinstall pavement and sidewalks lawns to condition and elevation which existed before excavation.
- .4 Clean and reinstall areas affected by work as directed by Engineer.

PART 1 - GENERAL

- 1.1 References
- .1 Nova Scotia Department of Transportation Specification dated January 1980 including all amendments.
 - .2 Nova Scotia Department of the Environment's "Handbook for Construction Sites".
 - .3 Asphalt in Pavement Maintenance (The Asphalt Institute) March 1993 Manual Series No 16 (MS-16) Edition.
- 1.2 Material Certification
- .1 Submit manufacturer's test data and certification that Hot Mixed Asphalt Concrete meets requirements of this section.
- 1.3 Delivery
- .1 Furnish copies of freight and way bills for asphalt cement as shipments are received and only when requested by Engineer.
- 1.4 Protection
- .1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38°C. Do not permit stationary loads on pavement for 24 hours after placement.
 - .2 Arrange paving schedule so as not to interfere with normal operations in the immediate area.
 - .3 Work to be performed within the time window stated on the requisition unless otherwise directed.
- 1.5 Definitions
- .1 **Engineer:** the Wing Construction Engineer Officer and/or the delegated representative. The delegated project manager for this Standing Offer Agreement is Mr. J McMaster at 902-765-1494 Ext 1531.
 - .2 **Old Asphalt and Concrete Removal:** to include the cutting, removal and disposal of defective asphalt and Portland cement concrete surfaces in place.
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- 1.5 Definitions
(Cont'd)
- .3 Common Excavation: to include the excavation, removal and disposal of the granular base courses and all material below the asphalt.
 - .4 Asphalt/Tack Coat: to include the supply, application of tack/prime coat, placement of HMAC, and compaction of Asphalt to 98 % of the Marshall Test Specimen Density. The Type of mix to be as specified by Engineer.
 - .5 Gravel in place: to include the supply, placement and compaction of the gravel to 98 % of Standard Proctor Density.
 - .6 HMAC: Hot Mixed Asphaltic Concrete.
 - .7 PCC: Portland Cement Concrete.
- 1.6 Measurement for Payment
- .1 Contractor to provide Engineer with service slips defining item and quantities of work performed daily.
 - .2 Pricing to be in accordance with the Contract documents.
 - .3 Advise Engineer soonest when quantities and/or dollar values are 75 % expended.
- 1.7 Requisitioning Services
- .1 The services to be performed to include the furnishing of all labour, material, and equipment on an as and when required basis for the repair of defective pavement both asphalt and concrete surfaces at 14 Wing Canadian Forces Base Greenwood, Camp Aldershot and Middleton Armouries in the Province of Nova Scotia.
 - .2 Services to be requisitioned against the Standing Offer Agreement on PWCGS Form 942 (Requisition against a Standing Offer Agreement)
 - .3 Requisitions to identify the following:
 - .1 Area of Work.
 - .2 Schedule of Work.
 - .3 Scope of Work to be performed.
 - .4 Estimated cost of Work.
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- 1.7 Requisitioning Services (Cont'd) .4 Invoicing to be submitted for each Requisition and to reflect the Requisition number assigned.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Mixture Type B, C, and D as described in Division 4, Section 4 of the Province of Nova Scotia Department of Transportation Specification dated 1 January 1980.
 - .2 Granular Materials: Class "A" and "C" gravels as described in Division 3, Section 6 and Section 4 of the Province of Nova Scotia Department of Transportation Specification dated 1 January 1980.
 - .3 Tack/Prime Coat: RC 70 or RS-1 to the Province of Nova Scotia Department of Transportation Specification dated 1 January 1980. Contractor to submit MSDS sheets for these products to Engineer including alternatives. Upon request by Engineer, submit manufacturer's test data and certification that asphalt tack/prime coat material meets requirements of this section.
 - .4 Asphalt Concrete Curbs and Gutters: to Division 4 Section 3 of the Province of Nova Scotia Department of Transportation Specification dated 1 January 1980.
 - .5 PCC Curb and Gutter: to Division 5 Section 16 of the Province of Nova Scotia Department of Transportation Specification dated 1 January 1980.
- 2.2 HMAC Mixing
- .1 Mix aggregates and asphalt cement in proportions to meet following criteria based on Standard Marshall Test procedure ASTM D 1559-89 with compactive effort of 50 blows on each face of specimen:
 - .1 Stability: 4.5 kN.
 - .2 Flow index: 2.0 - 4.0 minimum.
 - .3 Air Voids: 3 - 5% corrected for volume of asphalt absorbed into aggregates to ASTM D 3203-94.
 - .4 Minimum percentage void in mineral aggregate of 15%.
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PART 3 - EXECUTION

3.1 Plant and
Mixing Requirements

- .1 To ASTM D 995-88 - Specification for Requirements for Mixing Plants for Hot Mixed, Hot Laid, Bituminous Paving Mixtures.

3.2 Milling

- .1 Mill surfaces in locations as directed and where marked by Project Manager.
- .2 The depths and widths of milling is dependent on the condition of the Asphalt in place and is to be as directed by Engineer.
- .3 Paverlane joints and transverse cracks to be milled to a minimum width of 500 mm. Engineer to inspect milled trench and Contractor to remove additional widths of deteriorated asphalt until sound material is found. All Work to be as approved and directed by Engineer
- .4 All milled asphalt or Portland cement concrete to be removed and disposed of as directed by Engineer. Disposal of milled asphalt on DND property to be in locations with gravel hardstands to upgrade their surfaces. Grading of milled materials to be performed by others unless otherwise directed by Engineer.
- .5 All milled asphalt or Portland cement concrete identified to be disposed of off DND property to be at an approved dumpsite for materials being disposed of. Provide Engineer with letter from applicable municipal unit approving such a disposal.
- .6 Do NOT place tack coat or new asphalt until milled surfaces, joint or crack has been cleaned, inspected and approved by Engineer.

3.3 Old HMAC and
PCC Removals

- .1 Cut and remove asphalt from areas as directed by the Project Manager.
- .2 Use approved method to cut asphalt.
- .3 Prevent damage to asphalt and concrete surfaces to remain.

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- 3.3 Old HMAC and PCC Removals (Cont'd)
- .4 Prevent excessive disturbance to granular base courses.
 - .5 Remove and dispose of old asphalt off site as directed by Engineer.
- 3.4 Common Excavation
- .1 Excavate granular base courses to suitable depths as determined by Engineer.
 - .2 Remove unsuitable subgrade materials to depths as directed by Engineer.
 - .3 Remove large rocks, boulders and cobbles that have worked into the granular base courses.
 - .4 Avoid undermining of the granular base courses for existing asphalt to remain.
 - .5 Remove and dispose of old asphalt and Portland cement concrete off DND property at site approved for subject materials.
- 3.5 Granular Material Placement
- .1 Granular Base Courses:
 - .1 Compact subgrade, granular sub-base and granular base where applicable and/or directed by Engineer to 98 % Standard Proctor Density.
 - .2 Place and compact granular courses in lifts of 150 mm maximum compacted thickness.
- 3.6 Tack Coat Application
- .1 Prior to laying mix, clean surfaces of loose and foreign material.
 - .2 Obtain Engineer's approval of surface before applying asphalt tack coat.
 - .3 Dilute asphalt emulsion with water at 1:1 ratio for application. Mix thoroughly by pumping or other method approved by Engineer.
 - .4 Apply tack coat evenly to pavement surface at rate as directed by Engineer, but do not exceed 0.7 L/m².
 - .5 Apply only on dry surface.
-

3.6 Tack Coat
Application
(Cont'd)

- .6 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.
- .7 Do not apply asphalt tack coat when air temperature is less than 5°C or when rain is forecast within 2 h of application.
- .8 Apply tack coat only to surfaces that are expected to be overlaid on same day.
- .9 Evenly distribute localized excessive deposits of tack coat by brooming.
- .10 Where traffic is to be maintained, treat no more than one half of width of surface in one application.
- .11 Keep traffic off tacked areas until tack coat has set as directed by Engineer.
- .12 Re-tack contaminated or disturbed areas as directed by Engineer.
- .13 Permit tack coat to set before placing asphalt paving.

3.7 Transportation
of Mix

- .1 Transport mix to job site in vehicles cleaned of foreign material.
- .2 Paint or spray truck beds with light oil, limewater, soap or detergent solution, at least once a day or as required. Elevate truck bed and thoroughly drain. No excess solution will be permitted.
- .3 Schedule delivery of material for placing in daylight, unless Engineer approves artificial light.
- .4 Deliver material to paver at a uniform rate and in an amount within capacity of paving and compacting equipment.
- .5 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at a temperature within range as directed by Engineer, but not less than 135°C.

3.8 Placing

- .1 Place asphalt concrete in compacted lifts of thickness as follows:
 - .1 For areas to be asphalted; Use Type C mix, 50 mm layers of compacted thickness unless otherwise directed by Engineer. Place other mixture types when directed by Engineer.
 - .2 Use spreader applications when directed by Engineer. Spreader applications can involve overlays and or sidewalk repairs.
 - .2 Placing conditions:
 - .1 Place asphalt mixtures only when base or previous course is dry and air temperature is above 5°C.
 - .2 Minimum 135°C mix temperature required when spreading.
 - .3 Maximum 160°C mix temperature permitted at any time.
 - .4 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.
 - .5 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
 - .6 Place asphalt concrete in compacted layers not exceeding 50 mm.
 - .3 Where possible do tapering and levelling where required in lower lifts.
 - .4 Distribute material uniformly. Do not broadcast material.
 - .5 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not break down readily.
 - .6 After placing and before rolling, check surface with templates and straight edges and correct irregularities.
 - .7 Provide heating equipment to keep hand tools free from asphalt. Avoid high temperatures which may burn material. Do not use tools at a higher temperature than temperature of mix being placed.
 - .8 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.
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3.8 Placing
(Cont'd)

- .9 Do not throw surplus material on freshly screeded surfaces.
- .10 When hand spreading is used:
 - .1 Approved wood or steel forms, rigidly supported to assure correct grade and cross section, may be used. Use measuring blocks and intermediate strips to aid in obtaining required cross-section.
 - .2 Use forms where sidewalk overlays are requested.
 - .3 Forms to remain in place unless otherwise directed by engineer.

3.9 Compacting

- .1 Roll asphalt continuously to a density not less than 98% Standard Proctor density obtained with Marshall specimens prepared in accordance with ASTM D 1559-89 from samples of mix being used.
- .2 General:
 - .1 Start rolling operations as soon as placed mix can bear weight of roller without undue displacement of material or cracking of surface.
 - .2 Operate roller slowly initially to avoid displacement of material. For subsequent rolling do not exceed 5 km/h for static steel-wheeled rollers and 8 km/h for pneumatic-tired rollers.
 - .3 Overlap successive passes of roller by at least one half width of roller and vary pass lengths.
 - .4 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.
 - .5 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
 - .6 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
 - .7 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side. Finish joint repair to be flat and match existing grades of surfaces with no irregularities in the transverse direction exceeding 5 mm and not uniformly high or low in the longitudinal direction.

- 3.9 Compacting (Cont'd) .2 (Cont'd)
- .8 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.
- .3 Finish rolling:
- .1 Accomplish finish rolling while material is still warm enough for removal of roller marks. If necessary to obtain desired surface finish, Engineer may specify use of pneumatic-tired rollers.
- .2 Conduct rolling operations in close sequence.
- .3 Compact mix with hot tampers or other equipment approved by Engineer in areas inaccessible to roller.
- 3.10 Joints .1 Construct feather joints so that thinner portion of joint contains fine graded material obtained by raking out coarse aggregate in mix. Place and compact joint so that joint is smooth and without visible breaks in grade.
- .2 Locate feather joints where new asphalt meets existing asphalt.
- 3.11 Finish Tolerances .1 Finished asphalt surface to be within 5 mm of profiles indicated on drawings but not uniformly high or low.
- .2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with a 4.5 m straight edge placed in any direction.
- 3.12 Defective Work .1 Correct irregularities which 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 a true and even surface and compact immediately to specified density.

PART 1 - GENERAL

- 1.1 Reference Standards .1 Uniform Traffic Control Devices of Canada (1976).
- 1.2 Coordination and Scheduling .1 Contractor to notify Engineer prior to commencing work.
- .2 Contractor to be responsible for close coordination of all work.

PART 2 - PRODUCTS

- 2.1 Materials .1 Paint:
- .1 To CGSB 1-GP-74M, alkyd traffic paint.
 - .2 To CGSB 1-GP-149M, alkyd reflectorized traffic paint.
 - .3 Colour: to CGSB 1-GP-12c Standard Paint Colours.
 - .1 yellow 505-308.
 - .2 white 513- 301.
 - .3 black 512-301.
 - .4 blue 502-105
- .2 Thinner: to CAN/CGSB-1.5-M91.
- .3 Glass beads:
 - .1 Overlay type: to CGSB 1-GP-74M, sprinkled via a hopper immediately following spray nozzles.
- 2.2 Equipment Requirements .1 Painting Equipment:
 - .1 Pressurized bead dispensing to achieve proper bead application and reflectivity with minimum application rate of 1 litre per 4 m².
 - .2 Paint rollers and brushes for other markings as approved by Engineer.

PART 3 - EXECUTION

3.1 Surface
Preparation

- .1 Removal of pavement markings when required to be by paint method using masking paint colour black in areas as directed by Engineer.
- .2 Pavement surface to be free from surface water, frost, ice, dust, oil, grease and other foreign materials deleterious to making a good bond between pavement and paint

3.2 Application

- .1 Pavement markings to be painted to widths, layouts and dimensions in accordance with Uniform Traffic Control Guide and as identified by Engineer.
- .2 Unless otherwise approved by Engineer apply paint only when air temperature is above 10°C and no precipitation is forecast.
- .3 Apply traffic paint to 5 mil thickness.
- .4 Do not thin paint unless approved by Engineer.
 - .1 Where approved, paint to be thinned to a maximum of 10%.
- .5 Centre line spaces at intersections to be determined by Engineer.
- .6 Painted lines to be of uniform colour and density with sharp edges.
- .7 Thoroughly clean distributor tank before refilling with paint of different colour.
- .8 Following cleaning of equipment tank, contents to be disposed of off DND property at approved dumpsite for materials to be disposed of.
- .9 Apply glass beads at a rate of 700 g/L of paint.
 - .1 Beads to be used with yellow paint only.
- .10 Engineer will test paint and check wet film thickness at periodic intervals.
- .11 Painting of markings to be restricted to areas where repairs to pavements have eliminated crucial markings for traffic safety.

3.3 Protection of .1 Protect pavement markings until dry.
Completed Work

PART 1 - GENERAL

1.1 References

- .1 ASTM A 48-94a, Specification for Gray Iron Castings.
- .2 ASTM C 139-73(1989), Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
- .3 ASTM C 478M-94, Specification for Precast Reinforced Concrete Manhole Sections.
- .4 ASTM D 698-91, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).
- .5 CAN/CSA-A5-93, Portland Cement.
- .6 CAN/CSA-A8-93, Masonry Cement.
- .7 CAN/CSA-A23.1-94, Concrete Materials and Methods for Concrete Construction.
- .8 CSA A82.56-M1976, Aggregate for Masonry Mortar.
- .9 A165 Series-94 Series-M85, CSA Standards on Concrete Masonry Units.
- .10 CAN/CSA-G30.18-M92, Billet Steel Bars for Concrete Reinforcement.
- .11 CSA G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.2 Scheduling of Work

- .1 Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.

1.3 Measurement for Payment

- .1 Adjusting tops of existing manholes, catch basins and/or Valve Boxes will be measured in units adjusted.
-

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Cast-in-place concrete:
 - .1 Cement: to CAN/CSA-A5-93, type 10.
 - .2 Concrete mix design to produce 21 MPa minimum compressive strength at 28 days and containing 25 mm maximum size coarse aggregate, with water/cement ratio to CAN/CSA-A23.1-94, for class C-4 exposure.
 - .2 Mortar:
 - .1 Aggregate: to CSA A82.56-1950(R71).
 - .2 Cement: to CAN/CSA-A8-93.
 - .3 Adjusting rings: to ASTM C 478M-94.
 - .4 Concrete Brick: to A165 Series-94 Series.
 - .5 Frames, gratings, covers to dimensions as indicated and following requirements:
 - .1 Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.
 - .2 Gray iron castings: to ASTM A 48-94a, strength class 30B.
 - .3 Castings: coated with two applications of asphalt varnish sand blasted or cleaned and ground to eliminate surface imperfections.
 - .4 Manhole frames and covers: heavy duty municipal type for road service; light duty for landscape service. Cover cast without perforations and complete with two 25 mm square lifting holes.
 - .6 Valve Box Assembly: Standard of Acceptance Type V.I.3 piece slide type and associated components necessary to raise or lower tops to meet finished grades. Materials as supplied by Industrial Marine Products 15 Akerly Blvd, Dartmouth, NS PO Box 535. Components can consist of upper, lower, extensions and covers.
-

PART 3 - EXECUTION

- 3.1 Removals
- .1 Jackhammer sufficient asphalt away from all sides of the manhole, catch basin or valve box to permit excavation to a sufficient depth to allow adjustment of unit.
 - .2 Exercise care in removals not to damage structures or other facilities to remain. Make good any damage.
 - .3 Dispose of all removed materials promptly off site and dispose of at approved dumpsite.
- 3.2 Concrete Work
- .1 Do concrete work in accordance with CAN/CSA-A23.1-94, Concrete Materials and Methods for Concrete Construction.
- 3.3 Adjusting Tops of Existing Units
- .1 Ascertain the exact distance the catch basin, manhole cover or valve box must be adjusted to provide a smooth level surface in accordance with and consistent with new elevations resulting from repair or existing elevations whichever applies.
 - .2 Remove existing gratings, frames and I beams and store for re-use at locations designated by Engineer.
 - .3 Sectional units:
 - .1 Raise or lower straight walled sectional units by adding or removing precast sections as required.
 - .2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section. When amount of raise is less than 600 mm use standard manhole brick, moduloc or grade rings.
 - .4 Monolithic units:
 - .1 Raise monolithic units by roughening existing top to ensure proper bond and extend to required elevation with mortared brick course for 150 mm or less alteration. cast-in-place concrete.
-

3.3 Adjusting Tops
of Existing Units
(Cont'd)

- .4 (Cont'd)
- .2 Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.
- .3 When monolithic units with tapered upper section are to be lowered more than 150 mm, remove concrete for entire depth of taper plus as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.
- .5 Install additional manhole ladder rungs in adjusted portion of units as required.
- .6 Re-use existing gratings, frames and I beams.
- .7 Re-set gratings and frames to required elevation on not more than 4 courses of brick. Make brick joints and join brick to frame with cement mortar, parge and trowel smooth.
- .8 Re-set gratings and frames to required elevation on full bed of cement mortar, parge and trowel smooth.

3.4 Sealing over
Existing Units

- .1 Cut galvanized iron sheet to extend 50 mm beyond opening of existing manhole or catch basin grating. Center iron sheet over existing grating and spot or stitchweld to grating.
- .2 Fill with material approved by Engineer.

3.5 Installation

- .1 Backfill using Class A gravel and compact granular backfill in all cases to 98% Standard Proctor Density to ASTM D 698-91.
- .2 Layer thickness when compacting not to exceed 150 mm.

PART 1 - GENERAL

- 1.1 Related Work .1 Sodding: Section 02938
- 1.2 Source Quality Control .1 Advise Engineer of sources of topsoil to be supplied and provide access for sampling.
- .2 Contractor is responsible for soil analysis when requested by Engineer and requirements for amendments to supply topsoil as specified.
- .3 Acceptance of topsoil subject to inspection and/or soil analysis test results. Do not commence work until topsoil accepted by Engineer.

PART 2 - PRODUCTS

- 2.1 Topsoil .1 Topsoil: friable, neither heavy clay nor of very light sandy nature consisting of 45% sand, 35% silt, 20% clay and pH value of 6-7. Free from subsoil, roots, vegetation, debris, toxic materials, stones over 50 mm dia.
- .2 Fertilizer:
.1 Complete commercial synthetic fertilizer with minimum 65% insoluble nitrogen.
.2 Formulation ratio: 1:4:4.
.3 Bonemeal: finely ground with a minimum analysis of 20% phosphoric acid.
- .3 Limestone:
.1 Ground agricultural limestone containing minimum 85% of total carbonates.
.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm seive.
- .4 Water: potable.
- .5 Seed and Mixture:
.1 20% Kentucky Bluegrass.
.2 30% Creeping Red Fescue.
.3 10% Smooth Bromegrass.
.4 15% Timothy.
.5 10% Annual Rye Grass.
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- 2.1 Topsoil .5 (Cont'd)
(Cont'd) .6 5% Alsike Clover.
- .6 In containers with original tags.
- .7 Grass seed: Canada Certified No. 1 Grade in accordance with Government of Canada Seeds Act and Regulations.

PART 3 - EXECUTION

- 3.1 Stripping of Topsoil
- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
- .2 Stockpile in locations as directed by Engineer. Stockpile height not to exceed 2 m.
- .3 Dispose of unused topsoil where directed by Engineer off Work site.
- .4 Protect stockpiles from contamination and compaction.

- 3.2 Preparation of Existing Grade
- .1 Verify that grades are correct. If discrepancies occur, notify Engineer and do not commence work until instructed by Engineer.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off DND property at approved dump sites.
- .4 Course cultivate entire area which is to receive topsoil to depth of 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.
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3.3 Placing and
Spreading of
Topsoil

- .1 Place topsoil after Engineer has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm unless directed otherwise by Engineer, over unfrozen subgrade free of standing water.
- .3 Spread topsoil as indicated to following minimum depths after settlement and 90% compaction:
 - .1 100 mm for seeded and areas to be sodded.
- .4 Manually spread topsoil around any obstacles.
- .5 Ensure areas be seeded have been cultivated to depth of 25 mm and are moist to depth of 150 mm before seeding. Fine grade free of humps and hollows and free of deleterious and refuse materials.
- .6 Obtain Engineer's approval of topsoil grade and depth before starting to seed.

3.4 Application of
Limestone

- .1 For areas to be sodded or seeded: apply and mix limestone thoroughly into full specified depth of topsoil
 - .1 20 kg of lime per 100 m² of topsoiled area existing soil.

3.5 Application of
Seed

- .1 Seed top dressed area using 1 kg grass seed per 100 m² with seed mixture
- .2 For manual seeding:
 - .1 Use "Cyclone" type manually operated seeder.
 - .2 Use manually operated, water ballast, landscaping type, smooth steel drum roller. Ballast as directed by Engineer.
 - .3 Use equipment and method acceptable to Engineer.
- .3 Blend applications 150 mm into adjacent grass areas or previous applications to form uniform surfaces.
- .4 Sow half of required amount of seed in one direction and remainder at right angles as applicable.

3.5 Application of
Seed
(Cont'd)

- .5 Incorporate seed by light raking in cross directions.
- .6 Consolidate mechanically seeded areas by rolling area with equipment approved by Engineer immediately after seeding.

3.6 Application of
Fertilizer

- .1 Apply fertilizer at least one week after limestone application.
- .2 Spread fertilizer uniformly over entire area of topsoil at rate determined on basis of soil sample test.
- .3 Mix fertilizer thoroughly to full depth of topsoil.

3.7 Top Dressing

- .1 Top dress sodded areas with dry, friable and clean topsoil having high humus content.
- .2 Spread topsoil to thickness of 5 to 10 mm, filling in low and bare spots.
- .3 Overseed top dressed area using 1 kg grass seed per 100 m² with seed mixture of 50% Kentucky Blue grass and 50% Creeping Red Fescue or seed mixture as specified.
- .4 Mix topsoil and seed by means of light raking. Roll with light roller and water, ensuring contact between sod, seed and top dressing.
- .5 Water thoroughly and take precautions to prevent erosion of topsoil and seeding.

3.8 Finish Grading

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.
 - .2 Consolidate topsoil to required bulk density using equipment approved by Engineer. Leave surfaces smooth, uniform and firm against deep footprinting.
-

3.8 Finish Grading .3
(Cont'd)

Perform following operations from time of seed application until final acceptance by Engineer:

.1 Water seeded area as required to ensure germination and continued growth of grass. Control watering to prevent washouts.

.2 Cut grass to 40 to 50 mm whenever it reaches height of 65 mm. Remove clippings which will smother grass.

.3 Fertilize seeded areas one month after seeding. Spread evenly and water in well. Use Type 2 fertilizer, ratio 2:1:1, at rate of 50 kg per hectare. Postpone fertilizing until following spring if application falls within four week period prior to expected end of local growing season.

.4 Repair dead or bare spots to allow establishment of seed prior to acceptance.

3.9 Maintenance .1

Maintain seeded area from start of installation until final acceptance.

.2 Water seeded areas in sufficient quantities and at frequency required to maintain soil continuously moist to depth of 75 to 100 mm.

.3 Cut grass to 40 mm when it reaches height of 60 mm. Remove clippings which will smother grassed areas.

.4 Fertilize seeded areas one month after seeding with 2:1:1 ratio fertilizer. Spread evenly at rate of .5 kg of nitrogen/100m² and water in well.

3.10 Acceptance .1

Engineer will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading. Approval of topsoil material subject to soil testing and analysis.

.2 Testing of topsoil will be carried out by testing laboratory designated by Engineer. Soil sampling, testing and analysis to be in accordance with Provincial regulations and standards.

.3 Areas will be accepted by Engineer provided that:

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- 3.10 Acceptance .3 (Cont'd)
(Cont'd) .1 Seeded areas are uniformly established
and turf is free of rutted, eroded, bare or
dead spots.
.2 Seeded areas have been cut at least
twice.
- .4 Areas seeded in fall will be accepted in
following spring one month after start of
growing season provided acceptance conditions
are fulfilled.
- 3.11 Restoration of .1 Restore stockpile sites acceptable to
Stockpile Sites Engineer.
- 3.12 Surplus .1 Dispose of materials not required when and
Material where directed by Engineer off site.

PART 1 - GENERAL

- 1.1 Related Work .1 Topsoil and Finish Grading: Section 02921
- 1.2 Source Quality Control .1 Obtain approval from Engineer Consultant of sod at source.
.2 When proposed source of sod is approved, use no other source without written authorization.
- 1.3 Scheduling .1 Schedule sod laying to coincide with preparation of soil surface.
.2 Schedule sod installation after frost has left ground and before September 30.

PART 2 - PRODUCTS

- 2.1 Materials .1 Field sod: not sown or cultivated as turf grass crop but containing good percentage of common turf grasses and free of weeds, mosses and stones.
.1 Fertilize field sod minimum 2 weeks prior to lifting with 2:1:1 ratio fertilizer at rate of 0.5 kg nitrogen/100 m².
.2 Mow field sod within 36 h prior to lifting and remove clippings.
- .2 Water:
.1 Supplied by Engineer at designation source.
.2 Potable, free of impurities.
- .3 Fertilizer:
.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
.2 Complete, synthetic, slow release with 65% of nitrogen content in water-insoluble form.
-

PART 3 - EXECUTION

- 3.1 Preparation
- .1 Verify that grades are correct and prepared in accordance with Section 02921 - Topsoil and Finish Grading. If discrepancies occur, notify Engineer and do not commence work until instructed by Engineer.
 - .2 Do not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil or soil covered with snow, ice, or standing water.
 - .3 Fine grade surface free of humps and hollows to smooth, even grade, to contours and elevations indicated, to plus or minus 15 mm for Field or Pasture Sod, surface to drain naturally.
 - .4 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site in location as directed by Engineer.
 - .5 Cultivate fine grade to 25 mm depth immediately prior to sodding.
- 3.2 Sod Placement
- .1 Lay sod within 36 h of being lifted.
 - .2 Lay sod sections in rows, longitudinally, along contours of slopes, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
 - .3 Roll sod as directed by Engineer. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.
 - .4 Prior to sodding, obtain approval from Engineer that finished grade and depth of topsoil are satisfactory.
 - .5 Water sod immediately after laying to obtain moisture penetration into top 100 mm of topsoil.
-

3.2 Sod Placement .6
(Cont'd)

Stake sod in place for steep slope and/or when directed by Engineer.

3.3 Top Dressing

- .1 Top dress sodded areas with dry, friable and clean topsoil having high humus content.
- .2 Spread topsoil to thickness of 5 to 10 mm, filing in low and bare spots.
- .3 Overseed top dressed area using 1 kg grass seed per 100 m* with seed mixture of 50% Kentucky Blue grass and 50% Creeping Red Fescue or as specified in Section 02921.
- .4 Mix topsoil and seed by means of light raking. Roll with light roller and water, ensuring contact between sod, seed and top dressing.
- .5 Water thoroughly and take precautions to prevent erosion of topsoil and seeding.

3.4 Maintenance

- .1 Maintain sodded area from start of installation until final acceptance.
- .2 Water sodded areas in sufficient quantities and at frequency required to maintain soil under sod continuously moist to dept of 75 to 100 mm.
- .3 Cut grass to 40 mm when it reaches height of 60 mm. Remove clippings which will smother grassed areas.
- .4 Fertilize sodded areas one month after sodding with 2:1:1 ratio fertilizer. Spread evenly at rate of .5 kg of nitrogen/100 m* and water in well.

3.5 Acceptance

- .1 Field Sodded areas will be accepted by Engineer provided that:
 - .1 Sodded areas are properly established.
 - .2 Extent of surface soil visible when grass has been cut to height of 60 mm is acceptable.
 - .3 Sod is free of bare or dead spots and extent of weeds apparent in grass is acceptable.
 - .4 Sodded areas have been cut minimum 2 times, and within 24 h prior to acceptance.
-

3.5 Acceptance
(Cont'd)

- .1 (Cont'd)
 - .5 Fertilizing in accordance with fertilizer program has been carried out at least once.
- .2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

PART 1 - GENERAL

- 1.1 Related Work .1 Sitework Demolition and Removal:
Section 02070
- 1.2 References .1 CAN/CSA-A23.1-94 - Concrete Materials and
Methods of Concrete Construction.
- 1.3 Environmental
Conditions .1 Provide adequate nuisance dust protection
masks and ear protection to operator.
.2 Provide adequate ventilation adjacent to work
area.
.3 Wet cutting only will be permitted unless
directed otherwise by Engineer.
- 1.4 Protection .1 Protect surrounding surfaces from damage due
to work of this section. Make good such damage
to satisfaction of Engineer and at no
additional cost.
- 1.5 Concrete
Cutting .1 Contractor to cut concrete where required. Do
NOT use jackhammer unless approved by Engineer
and only for instances as outlined in
paragraph 3.2.4 of this section.
. 2 Concrete cutting is for both HMAC and PCC
structures.
- 1.6 Contractor's
Responsibilities .1 Furnish labour and facilities to:
.1 Provide access to work requiring cutting.
.2 Make good work disturbed by Cutting.
.3 Provide storage on site for cutting
specialists equipment and tools.
-

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Arrange with Engineer for provision of water and electricity for use during cutting operation.
 - .2 Concrete cutting saw to CSA C22.2-94 71.1-M89 - Portable Electric Tools.

PART 3 - EXECUTION

- 3.1 Preparation
- .1 Do not commence work until all electrical and mechanical services likely to be encountered in the process of the cut have been identified and disconnected.
 - .2 Define exactly, outline of area to be cut and removed, and mark with indelible lines. All quantities and thicknesses to be determined with Engineer and provided to Engineer in writing.
 - .3 Advise Engineer prior to commencing cutting.
 - .4 Engineer to approve areas, quantities, and thicknesses identified prior to any cutting.

- 3.2 Cutting, General
- .1 Sawcut to depth required using a purpose made blade in a specialized concrete saw. Depth to be a minimum of 15 mm to avoid the necessity of feather edging.
 - .2 Sawed surfaces to be smooth, plane and parallel unless otherwise specified.
 - .3 Remove all debris and clean surfaces of loose material.
 - .4 Where complete section cannot be removed by cut alone, use light jackhammering or other chipping tools to avoid damaging surrounding areas and loss of bond in remaining concrete.
 - .5 Remove all concrete required to perform work specified and as approved by Engineer.

PART 1 - GENERAL

- 1.1 References
- .1 CAN/CSA-A23.1-94, Concrete Materials and Methods of Concrete Construction.
 - .2 CAN3-086-M84, Engineering Design in Wood (Working Stress Design).
 - .3 CAN/CSA-086.1-94, Engineering Design in Wood (Limit States Design).
 - .4 CAN3-086-M84, Supplement No. 1-1987, to CAN3-086-M84, Engineering Design in Wood (Working Stress Design) and CAN/CSA-086.1-94 Engineering Design in Wood (Limit States Design).
 - .5 CSA O121-M1978, Douglas Fir Plywood.
 - .6 CAN/CSA-S269.3-M92, Formwork.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Formwork lumber: plywood and wood formwork materials to CSA O121-M1978 CAN3-086-M84 CAN/CSA-086.1-94 CAN3-086-M84 CSA O153-M1980.
 - .2 Form ties: removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia in concrete surface.
 - .3 Form stripping agent: colourless mineral oil, free of kerosene, with viscosity between 70 and 110 s Saybolt Universal 15 to 24 mm²/s at 40°C, flashpoint minimum 150°C, open cup.
 - .4 CSA B111-1974 Wire Nails, Spikes and Staples.
 - .5 CSA O121-M1978 Douglas Fir Plywood.
 - .6 CAN/CSA-O141-91 Softwood Lumber.
 - .7 CSA O151-M1978 Canadian Softwood Plywood.
 - .8 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber 1991.
-

PART 3 - EXECUTION

- 3.1 Erection
- .1 Verify lines, levels and centres before proceeding with formwork and ensure dimensions agree with drawings.
 - .2 Fabricate and erect formwork in accordance with CAN/CSA-S269.3-M92 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1-94.
 - .3 Align form joints and make watertight. Keep form joints to minimum.
 - .4 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
 - .5 Clean formwork in accordance with CAN/CSA-A23.1-94, before placing concrete.
 - .6 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 2 days for curbs.
 - .7 Re-use formwork subject to requirements of CAN/CSA-A23.1-94.

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PART 1 - GENERAL

- 1.1 Standard .1 Concrete materials and methods of construction: to CAN/CSA-A23.1-94 unless otherwise specified.
- 1.2 Inspection .1 Concrete testing: to CSA CAN3-A23.2-94 by testing laboratory designated and paid for by Engineer. Accelerated test methods will apply.
- .2 Give Engineer minimum 24 h notice before each concrete pour.

PART 2 - PRODUCTS

- 2.1 Materials .1 Cement: to CAN/CSA-A5-93, Type 10.
- .2 Joint sealer/filler: purpose-made, pourable or gun-grade type, grey in colour.
- .3 All other concrete materials: to CAN/CSA-A23.1-94.
- 2.2 Mix Proportions .1 Method: Alternative (1) of CAN/CSA-A23.1-94.
- .2 Cement type: as specified under 2.1.
- .3 Minimum 28 day compressive strengths and exposure classifications:
- .1 All concrete other than curb and gutters: 25 MPa; C-4.
- .2 PCC concrete: to be to NSDOT specifications for curbing, and curb and gutters 32 MPa.
- .4 Nominal size of coarse aggregate: Clause 14 of CAN/CSA-A23.1-94.
- .5 Slump: to Table 6 of CAN/CSA-A23.1-94.
- .6 Air content: all concrete to contain purposely entrained air in accordance with Table 10 of CAN/CSA-A23.1-94.
- .7 Admixtures: to Clause 6 of CAN/CSA-A23.1-94.
-

PART 3 - EXECUTION

3.1 Inserts

- .1 Cast in posts, braces and other inserts required to be built-in.
- .2 Ensure top surfaces of all concrete are convex in nature to provide positive drainage of water.
- .3 Seal all joints between steel posts and concrete with sealer to prevent water infiltration.

3.2 Finishes

- .1 Formed surfaces exposed to view: steel trowelled finish to CAN/CSA-A23.1-94.
- .2 Provide radiused edges on top perimeter of all concrete as indicated or specified.
- .3 Curb profiles to be in accordance with NSDOT specifications.

3.3 Curing

- .1 Cure and protect concrete in accordance with CAN/CSA-A23.1-94, except that curing compounds shall not be used where bond is required by subsequent topping or coating.