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## **PART 1 - GENERAL**

### **1.1 REFERENCES**

- .1 National Building Code of Canada (NBC) 2005 including all amendments up to the date of bid closing.

### **1.2 DESCRIPTION OF THE WORK**

- .1 The project includes the following work. The list below is not necessarily exhaustive and in no way releases the Contractor from the obligation of carrying out the project in its entirety according to generally accepted practices as well as the intentions and general principles as described in these specifications and drawings (Annexe A).
  - .1 Delimit and mark all the sections to be paved;
  - .2 Excavate the required sections;
  - .3 Transport any and all excess excavated material and waste to a site indicated by the CSC Representative;
  - .4 Install and compact the proper granular sub-base at sections B and D only;
  - .5 Install the geotextile membrane;
  - .6 Install and compact the proper granular base;
  - .7 Install one layer of bituminous asphalt where required;
  - .8 Restore the worksite to its original state and conditions.
- .2 The work excluded from the present contract are:
  - .1 Remove and dispose of the existing paving stones;
  - .2 Dispose of the excess excavated material;
  - .3 Landscaping and seeding or sodding;
  - .4 Modifications or work on concrete sidewalks;
  - .5 Provide the onsite Laboratory.

### **1.3 SECURITY SCREENING**

- .1 All workers shall undergo security screening in order to be granted a security classification as required by the Correctional Service of Canada and Public Works and Government Services Canada.
- .2 Section 01 35 13 – Special project procedures for CSC security requirements.
- .3 At the start of work, a special job-site meeting will be held with institution representatives to define the instructions governing security and site operation in a correctional environment.

### **1.4 CODES**

- .1 The specifications will require that the work and materials comply with the National Building Code of Canada (NBC) and all other applicable provincial or local codes. The strictest requirements shall apply in case of contradiction or discrepancy.
- .2 The work shall be performed in a manner that meets or exceeds the following requirements:
  - .1 Contract documents;
  - .2 Specified standards and codes as well as other documents cited as references.

### **1.5 REQUIRED DOCUMENTS**

- .1 A copy of the following documents shall be kept at the job site:
    - .1 Contract drawings;
    - .2 Specifications;
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- .3 Amendments;
- .4 Modification orders;
- .5 Other contract amendments;
- .6 On-site test reports;
- .7 Approved work schedule;
- .9 Manufacturer installation and start-up instructions.

## 1.6 WORK SCHEDULE

- .1 The successful bidder shall initiate preparatory work immediately upon receiving notice that the contract has been awarded. The work covered by this document, including measures to correct construction deficiencies, must be completed within the schedule specified herein. Failure to comply with the schedule shall be dealt with as provided for in the Standard Acquisition Clauses and Conditions (SACC) Manual, Public Works and Government Services Canada (PWGSC).
- .2 Within five (5) business days of contract award, submit a work schedule for the various project phases and the completion date, **which must be at the latest on December 2<sup>nd</sup> 2016**.
- .3 Within ten (10) business days of contract award, submit shop drawings, technical data sheets and security screening applications for approval.
- .4 The work sequence is as follows:
  - .1 Submission of the detailed schedule, technical data sheets and security screening applications for approval;
  - .2 Approval of documents submitted;
  - .3 Construction start-up meeting;
  - .4 Beginning of construction work:
    - .1 Section A, in front of ABCD pavilion;
    - .2 Section B, in front of EFGH pavilion;
    - .3 Section C, in front of KLMN pavilion;
    - .4 Section D, in front of OPRS pavilion;
    - .5 Section E, new path, large courtyard;
    - .6 Section F, new path, small courtyard;
    - .7 Section G, new path, kitchen;
    - .8 Section H, road widening building 2;
    - .9 Section I, weightlifting site.
  - .5 Site cleanup and correcting identified deficiencies.
- .7 The initial schedule needs to be adjusted in accordance to changes to milestones and handed in every week to the CSC Project Manager. The adjusted schedule of the following week must be received at noon on the Thursday at the latest. Any modifications to the schedule shall require the approval of the CSC Project Manager.

## 1.7 ACCEPTANCE OF EQUIVALENTS

- .1 No equivalence or substitution will be accepted.

## 1.8 NOISY WORK ENVIRONMENT

- .1 No radios or "boom boxes" shall be tolerated at the job site.

## **1.9 CONSTRUCTION SITE STAKING**

- .1 The elevations shall be established and the site fully staked based on control points and elevations indicated on the plans and in the specifications.
- .2 The Contractor shall assume full responsibility for staking the site and ensure complete implementation according to the location, lines, and grades indicated.
- .3 The Contractor shall provide the material required for staking.
- .4 The Contractor shall provide the materials required, such as rules and models, to facilitate the inspection of the staking work.
- .5 The Contractor shall provide stakes and the like required to carry out staking work.

## **1.10 EXISTING SYSTEMS AND INFRASTRUCTURES**

- .1 Should installations be discovered during the course of work, the Ministry representative shall be immediately informed and a written report containing the observations provided to him.

## **1.11 ADDITIONAL DRAWINGS**

- .1 The Ministry representatives may provide supplemental drawings for clarification. Such supplemental drawings shall be considered to have the same significance and scope as the contract documents.

## **PART 2 - PRODUCTS**

### **2.1 NOT APPLICABLE**

## **PART 3 - EXECUTION**

### **3.1 NOT APPLICABLE**

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 PURPOSE**

- .1 To ensure that both the construction project and the institutional operations may proceed without undue disruption or hindrance and that the security of the Institution is maintained at all times.

### **1.2 DEFINITIONS**

- .1 "Contraband" means:
  - .1 An intoxicant, including alcoholic beverages, drugs and narcotics,
  - .2 A weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization,
  - .3 An explosive or a bomb or a component thereof,
  - .4 Currency over any applicable prescribed limit \$25,00,
  - .5 Any item not described in paragraphs (a) to (d) that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.
- .2 "Unauthorized Smoking Items" means all smoking items including, but not limited to, cigarettes, cigars, tobacco, chewing or snuffing tobacco, cigarette making machines, matches and lighters.
- .3 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.
- .4 "CSC" means Correctional Service Canada.
- .5 "Director" means Director or Warden of the Institution as applicable or their representative.
- .6 "Construction employees" means persons working for the general contractor, the sub-contractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.
- .7 «Ministry representative» means, project manager from Public Services and Procurement Canada (PSPC) or from Correctional Service Canada (CSC), depending on the project.
- .8 "Perimeter" means the fenced or walled area of the institution that restrains the movement of the inmates.
- .9 "Construction zone" means the area as shown on the contract drawings where the contractor will be allowed to work. This area may or may not be isolated from the security area of the institution.

### **1.3 REFERENCES**

- .1 Laws, norms and regulations valid in Quebec:
  - .1 Canada Labour Code - Part II, Canadian Occupational Safety and Health regulations
  - .2 Construction Safety Code (L.R.Q., S-2.1, r.6)
  - .3 Act Respecting Occupational Health and Safety, RSQ Ch. S2.1

### **1.4 PRELIMINARY PROCEEDINGS**

- .1 Prior to the commencement of work, the contractor shall meet with the Ministry Representative to:
    - .1 Discuss the nature and extent of all activities involved in the Project.
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- .2 Establish mutually acceptable security procedures in accordance with this instruction and the institution's particular requirements.
- .2 The contractor will:
  - .1 Ensure that all construction employees are aware of the CSC security requirements.
  - .2 Co-operate with institutional personnel in ensuring that security requirements are observed by all construction employees.

## 1.5 CONSTRUCTION EMPLOYEES

- .1 Submit to the Ministry Representative a list of the names with date of birth of all construction employees to be employed on the construction site and a security clearance form for each employee.
- .2 Allow two (2) weeks for processing of security clearances. Employees will not be admitted to the Institution without a valid security clearance in place and a recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC institutions are not valid at the institution where the project is taking place.
- .3 The Director may require that facial photographs may be taken of construction employees and these photographs may be displayed at appropriate locations in the institution or in an electronic database for identification purposes. The Director may require that Photo ID cards be provided for all construction workers. ID cards will then be left at the designated entrance to be picked upon arrival at the institution and shall be displayed prominently on the construction employees clothing at all time while employees are at the institution.
- .4 Entry to Institutional Property will be refused to any person there may be reason to believe may be a security risk.
- .5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:
  - .1 Appear to be under the influence of alcohol, drugs or narcotics.
  - .2 Behave in an unusual or disorderly manner.
  - .3 Are in possession of contraband.

## 1.6 WORK SCHEDULE AND WORKSITE ACCESS

- .1 The work shall be performed inside the institution's enclosures, and working hours will therefore be restricted.
- .2 Access to the site may be obtained at the service gate located at 205 Montée St-François for company vehicles only.
  - .1 The gate is open Monday to Friday from 07:45 to 11:45 and from 12:45 to 15:15.
- .3 Access may be obtained at the main entrance at 6099 Lévesque Boulevard for employees on foot. They may leave their vehicles in the visitor parking.
  - .1 Regular operating hours are from 07:00 to 16:00.
- .4 Plan vehicle arrival and departure to and from the site and maximize trips to minimize the loss of time involved.

## 1.7 VEHICLES

- .1 All unattended vehicles on CSC property shall have windows closed; doors and trunks shall be locked and keys removed. The keys shall be securely in the possession of the Departmental Representative or an employee of the company that owns the vehicle.
  - .2 The director may limit at any time the number and type of vehicles allowed within the Institution.
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- .3 Drivers of delivery vehicles for material required by the project might require security clearances and must remain with their vehicle the entire time that the vehicle is in the Institution. The director may require that these vehicles be escorted by Institutional staff or Commissionaires while in the Institution.
- .4 If the Director permits trailers to be left inside the secure perimeter of the Institution, these trailer doors will be locked at all times. All windows will be securely locked when left unoccupied. All trailer windows shall be covered with expanded metal mesh. All storage trailers inside and outside the perimeter must be locked when not in use.

### 1.8 PARKING

- .1 The parking area(s) to be used by construction employees will be designated by the Director. Parking in other locations will be prohibited and vehicles may be subject to removal.

### 1.9 SHIPMENTS

- .1 All shipments of project material, equipment and tools shall be addressed in the Contractor's name to avoid confusion with the institution's own shipments. The contractor must have his own employees on site to receive any deliveries or shipments. CSC staff will **NOT** accept receipt of deliveries or shipments of any material equipment or tools for the contractor.

### 1.10 TELEPHONES

- .1 There will be no installation of telephones, Facsimile machines and computers with Internet connections permitted within the perimeter of the institution unless prior approval of the Director is received.
- .2 Wireless cellular and digital telephones, including but not limited to devices for telephone messaging, pagers, BlackBerries, telephone used as 2-way radios, are not permitted within the perimeter of the Institution unless approved by the Director. If authorized, the user will not permit their use by any inmate.
- .3 The Director may approve but limit the use of two way radios.

### 1.11 WORK HOURS

- .1 Work hours within the Institution are: Monday to Friday 7 AM to 4 PM.
- .2 Work will not be permitted during weekends and statutory holidays without the permission of the Director. A minimum of seven days advance notice will be required to obtain the required permission. In case of emergencies or other special circumstances, this advance notice may be waived by the Director.
- .3 If the contractor must cancel one or more days of work, the Ministry representative must be noticed a minimum of 24 hours in advance. Costs to Canada for such events may be attributed to the contractor. See the table below for the rates.

Level	Points	Regular hours	Additional hours	Holidays
Base level	0 – 15	24.20\$	35.20\$	46.19\$

## 1.12 OVERTIME WORK

- .1 No overtime work will be allowed without permission of the Director. Give a minimum forty-eight (48) hours advance notice when overtime work on the construction project is necessary and approved. If overtime work is required because of an emergency such the completion of the asphalt coat or work to make the construction safe and secure, the contractor shall advise the Ministry representative as soon as this condition is known and follow the directions given by the Director. Costs to Canada for such events may be attributed to the contractor.
- .2 When overtime work, weekend statutory holiday work is required and approved by the Director, extra staff members may be posted by the Director or his designate, to maintain the security surveillance. The actual cost of this extra staff may be attributed to the contractor.

## 1.13 TOOLS AND EQUIPEMENTS

- .1 Maintain on site a complete list of all tools and equipment to be used during the construction project. Make this inventory available for inspection when required.
    - .1 « Prohibited" tools :
      - .1 The use of RAMSET cartridge hammers is strictly forbidden in the institution.
      - .2 Oxyacetylene torches shall be stored under lock and key at all times. Oxygen canisters shall be stored in a separate location form the torches, and shall also remain under lock and key at all times. Inventory must be done at the end of each day.
      - .3 The percussion hammers, ropes and ladders are forbidden except in areas where the inmates do not have access.
  - .2 Throughout the construction project maintain an up-to-date list of tools and equipment specified above.
  - .3 Keep all tools and equipment under constant supervision, particularly power-driven and cartridge-driven tools, cartridges, files, saw blades, rod saws, wire, rope, ladders and any sort of jacking device.
  - .4 Store all tools and equipment in approved secure locations.
  - .5 Lock all tool boxes when not in use. Keys are to remain in the possession of the employees of the contractor.
  - .6 All missing or lost tools or equipment shall be reported immediately to the Director.
  - .7 The Director will ensure that the security staff members carry out checks of the Contractor's tools and equipment against the list provided by the Contractor. These checks may be carried out at the following intervals:
    - .1 At the beginning and conclusion of every construction project.
    - .2 Weekly, when the construction project extends longer than a one week period.
  - .8 The contractor must ensure that all tools and equipments are taken away from the construction zone daily.
  - .9 Certain tools/equipment such as cartridges and hacksaw blades are highly controlled items. The contractor will be given at the beginning of the day, a quantity that will permit one day's work. Used blades/cartridges will be returned to the Director's representative at the end of each day.
  - .10 If propane or natural gas is used for heating the construction, the institution will require that an employee of the contractor supervise the construction site during non-working hours.
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#### **1.14 KEYS AND PADLOCKS**

- .1 All security hardware required to lock the construction zones are provided by the CSC. The Commissionaires in charge of site surveillance will have the required keys to unlock them.
- .2 The security locks and keys required to lock the new gates is provided by others.

#### **1.15 PRESCRIPTION DRUGS**

- .1 Employees of the contractor who are required to take prescription drugs during the workday shall obtain approval of the Director to bring a one day supply only into the Institution.

#### **1.16 SMOKING RESTRICTIONS**

- .1 Contractors and construction employees are not permitted to smoke inside correctional facilities or outdoors within the perimeter of a correctional facility and must not possess unauthorized smoking items within the perimeter of a correctional facility.
- .2 Contractors and construction employees who are in violation of this policy will be requested to immediately cease smoking or dispose of any unauthorized smoking items and, if they persist, will be directed to leave the institution.
- .3 Smoking is only permitted outside the perimeter of a correctional facility in an area to be designated by the Director.

#### **1.17 CONTREBAND**

- .1 Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on institutional property.
- .2 The discovery of contraband on the construction site and the identification of the person(s) responsible for the contraband shall be reported immediately to the Director.
- .3 Contractors should be vigilant with both their staff and the staff of their sub-contractors and suppliers that the discovery of contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.
- .4 Presence of arms and ammunition in vehicles of contractors, sub-contractors and suppliers or employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.

#### **1.18 SERCHES**

- .1 All vehicles and persons entering institutional property may be subject to search.
- .2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of contraband or unauthorized items, he may order that person to be searched.
- .3 All employees entering the Institution may be subject to screening of personal effects for traces of contraband drug residue.

#### **1.19 ACCESS TO AND REMOVAL FROM INSTITUTIONAL PROPERTY**

- .1 Construction personnel and commercial vehicles will not be admitted to the institution after normal working hours, unless approved by the Director.
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## 1.20 MOVEMENT OF VEHICLES

- .1 Escorted commercial vehicles will be allowed to enter or leave the institution through the vehicle access gate during the following hours from **Monday to Friday**:
  - .1 07:45 hrs. to 11:30 hrs.
  - .2 12:45hrs to 15:15 hrs.
- .2 The contractor should be advised that there might be a waiting period in line in order to enter the establishment by the access gate. The CSC employees will have priority over the contractor when they need enter by the service gate.
- .3 The contractor shall advise the Ministry representative twenty four (24) hours in advance to the arrival on the site of heavy equipment such as concrete trucks, cranes, etc.
- .4 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must be under continuous supervision by CSC staff or Commissionaires working under the authority of the Director.
- .5 Commercial vehicles will only be allowed access to institutional property when their contents are certified by the Contractor or his representative as being strictly necessary to the execution of the construction project.
- .6 Vehicles shall be refused access to institutional property if, in the opinion of the Director, they contain any article which may jeopardize the security of the institution.
- .7 Private vehicles of construction employees will not be allowed within the security perimeter of medium or maximum security institutions without the authorization of the Director.
- .8 With prior approval of the Director, a vehicle may be used in the morning and evening to transport a group of employees to the work site. This vehicle will not remain within the Institution the remainder of the day.
- .9 With the approval of the Director, certain equipment may be permitted to remain on the construction site overnight or over the weekend. This equipment must be securely locked, with the battery removed. The Director may require that the equipment be secured with a chain and padlock to another fixed object.

## 1.21 MOVEMENT OF CONSTRUCTION EMPLOYEES ON INSTITUTIONAL PROPERTY

- .1 Subject to the requirements of good security, the Director will permit the Contractor and his employees as much freedom of action and movement as is possible.
- .2 However, notwithstanding paragraph above, the Director may:
  - .1 Prohibit or restrict access to any part of the institution.
  - .2 Require that in certain areas of the institution, either during the entire construction project or at certain intervals, construction employees only be allowed access when escorted by a member of the CSC security staff or a commissionaire.
- .3 During the lunch and coffee/health breaks, all construction employees will remain within the construction site. Construction employees are not permitted to eat in the officer's lounge or the dining room of the institution.
- .4 Construction employees must be escorted by a commissionaire in order to have access to washrooms.

## 1.22 SURVEILLANCE AND INSPECTION

- .1 Construction activities and all related movement of personnel and vehicles will be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.
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- .2 CSC staff members will ensure that an understanding of the need to carry out surveillance and inspections, as specified above, is established among construction employees and maintained throughout the construction project.

### **1.23 CESSATION OF WORK**

- .1 The director may order at any time that the contractor, his employees, sub-contractors and their employees to not enter or to leave the work site immediately due to a security situation occurring within the Institution. The contractor's site supervisor shall note the name of the CSC staff member giving this instruction, the time of the request and obey the order as quickly as possible.
- .2 The contractor shall advise the Ministry Representative of this interruption of the work within 24 hours.

### **1.24 CONTACT WITH INMATES**

- .1 Unless specifically authorized, it is forbidden to come into contact with inmates, to talk with them, to receive objects from them or to give them objects. Any construction employee doing any of the above will be removed from the site and his security clearance revoked.
- .2 It is to be noted that cameras are not allowed on CSC property.
- .3 Notwithstanding the above paragraph, if the director approves of the usage of cameras, it is strictly forbidden to take pictures of inmates, of CSC staff members or of any part of the Institution other than those required as part of this contract.

### **1.25 COMPLETION OF CONSTRUCTION PROJECT**

- .1 Upon completion of the construction project or, when applicable, the takeover of a facility, the Contractor shall remove all remaining construction material, tools and equipment that are not specified to remain in the Institution as part of the construction contract.

## **PART 2 – PRODUCTS**

### **2.1 NOT APPLICABLE**

## **PART 3 - EXECUTION**

### **3.1 NOT APPLICABLE**

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 31 23 13 – Rough grading
- .2 Section 31 23 33 – Excavating, trenching and backfilling
- .3 Section 32 12 17 – Asphalt paving

### **1.2 REFERENCES**

- .1 Quebec laws, regulations and standards in force:
  - .1 Occupational Health and Safety Act
  - .2 Construction Safety Code (R.S.Q., S-2.1, r.6)
  - .3 Occupational Health and Safety Regulations

### **1.3 INSTALLATION AND REMOVAL**

- .1 Provide, install or build the temporary installations and enclosures needed in order to execute work expeditiously.
- .2 One (1) day prior to installing temporary barriers, confirm their locations and the installation schedule with the Ministry representative.
- .3 Ensure that the protection installations allows easy vehicles circulation the worksite while restricting access to nearby individuals.

### **1.4 HOARDING**

- .1 Provide all temporary protection and safety equipment required to restrict inmate access to the worksite, for the duration of the work.
- .2 Ensure that the positioning of site enclosures does not at any time impede the proper functioning of the institution's operations.

### **1.5 ACCESS TO SITE**

- .1 Provide and maintain access roads, sidewalk crossings, ramps and pedestrian crossings as may be required for access to work.
  - .1 Minimum width of 1200 mm for pedestrian crossings.
  - .2 Minimum width of 3600 mm for vehicle access.

### **1.6 TRAFFIC FLOW**

- .1 Provide and maintain competent signal flag operators and traffic signals and barricades as required to perform the work and protect the public.
  - .2 Ensure the proper functioning of circulating areas located in proximity outside of the work zones.
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## **1.7 PROTECTION OF SURROUNDING STRUCTURES AND FACILITIES**

- .1 Protect surrounding structures and facilities from all damage that may result during the work.
- .2 If applicable, assume full responsibility for damage incurred.

## **1.8 SECURITY**

- .1 The Contractor shall ensure that all tools and equipment outside of isolated work zones are under constant surveillance, with particular attention to motorized tools, files, saw blades, metal wire, cables and ladders.
- .2 Remove all equipment, machinery and materials from the institution at the end of each work day.
- .3 Immediately report any tools or equipment that are lost or missing to the institution's security service.
- .4 **"Ramsets"** and **"Hiltis"** and impact tools with loads are not permitted.

## **PART 2 - PRODUCTS**

### **2.1 SITE ENCLOSURE**

- .1 Use a construction site delimitation system equivalent to pylons
- .2 Use a system that is stable and self-supporting, with the following specifications:
  - .1 The equipments might not be used as a weapon or as means of defense by inmates.
  - .2 The equipments must be visible from afar day and night, in order to ensure a good pedestrian and vehicle circulation around the worksite.
- .3 Keep existing exits adjacent to the work free of obstacles.

## **PART 3 - EXECUTION**

### **3.1 NOT APPLICABLE**

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 WASTE MANAGEMENT OBJECTIVES**

- .1 Carry out solid construction waste control.
- .2 Protect the environment and prevent pollution and environmental impact.

### **1.2 RELATED SECTIONS**

- .1 Section 31 05 17 – Aggregate materials
- .2 Section 31 23 13 – Rough grading
- .3 Section 31 23 33 – Excavating, trenching and backfilling
- .4 Section 31 32 21 – Geotextiles
- .5 Section 32 11 19 – Granular sub-base and aggregate base course
- .6 Section 32 12 17 – Asphalt paving

### **1.3 SUBMITTALS**

- .1 Upon completion of the work, send a copy of the waste disposal report to Ministry Representative.
- .2 The contractor must provide a letter of attestation for the destination and use of unused granular and aggregate material that are disposed of offsite.

### **1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 The Contractor is responsible for choosing waste treatment sites.
  - .2 Divert unused metal materials to an appropriate recycling facility approved by Ministry Representative.
  - .3 Gather, separate and remove from the worksite wrappings and dispose of them in the appropriate recycling bins.
  - .4 Place in the appropriate recipient the substances that are considered by definition, toxic or dangerous waste material
  - .5 Fold and flatten any metal strips before disposing of them in the pro bins.
  - .6 It is forbidden to bury rubbish or waste materials.
  - .7 It is forbidden to dispose of waste, volatile materials, mineral spirits, oil, paint thinner or any other waste material into storm or sanitary sewers or waterways. These must be disposed of in accordance with the *Canadian Environmental Protection Act* and the *Québec Residual Materials Management Policy (1998-2008)*.
  - .8 Granular and aggregate materials:
    - .1 Unused granular and aggregate materials must be managed according to the *Land Protection and Rehabilitation Regulation Environment Quality Act from the Ministry of Sustainable Development, Environment and Parks (MSDEP 1999)*. All extra usable material could be reused onsite, an area chosen by the CSC, only when they are compatible with the environmental (respecting usage criteria for each of the measured parameters) and geotechnical qualities of the receiving site.
    - .2 Unused granular and aggregate materials must not be brought to a landfill, unless if it is used as daily covering material in a sanitary landfill.
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- .9 Bitumen and other asphalte products:
  - .1 It is forbidden to dispose of unused bitumen in sewers, streams, lakes, on the ground or anywhere it could represent environmental or health risks.
  - .2 Bring unused bitumen materials to a suitable recycling plant or store in an adequate site for later disposal.
- .10 Excavated materials:
  - .1 If needed, laboratory analysis costs will be handled by the CSC. Any and all analysis will be done by a laboratory selected by the Ministry Representative.
  - .2 The contractor must transport all unused excavated materials to a site as indicated by the Ministry Representative. All sites are situated on the Laval Complex.
  - .3 The SCC will be responsible for the disposition of class A-B and B-C contaminated materials as well as the associated costs.

## **PART 2 - PRODUCTS**

### **2.1 NOT APPLICABLE**

## **PART 3 - EXECUTION**

### **3.1 CLEANING**

- .1 Remove tools and waste materials on completion of work, and leave area in clean and orderly condition.
- .2 Clean up work area as work progresses.
- .3 Source separate waste materials to be reused/recycled into specified areas.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 74 21 – Construction waste management and disposal
- .2 Section 31 23 13 – Rough grading
- .3 Section 31 23 33 – Excavating, trenching and backfilling
- .4 Section 31 32 21 – Geotextiles
- .5 Section 32 11 19 – Granular sub-base and aggregate base course
- .6 Section 32 12 17 – Asphalt paving

### **1.2 REFERENCES**

- .1 Gouvernement du Québec :
  - .1 Ministère du Développement durable, de l'Environnement et des Parcs
    - .1 Politique de protection et de réhabilitation des terrains contaminés (1999).
- .2 Bureau de normalisation du Québec (BNQ) :
  - .1 NQ 2560-114/2002, Travaux de génie civil – Granulats.
- .3 American Society for Testing and Materials (ASTM):
  - .1 ASTM D1557-[00], Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>);
  - .2 ASTM D1883-[99], Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

### **1.3 SUBMITTALS**

- .1 At least 10 working days before the beginning of the works, submit to the Departmental representative, for each type of granular material:
  - .1 Identification and location of the quarry or sand pit;
  - .2 A conformity certificate of the materials after treatment (crushing, washing, adding, screening). The certificate shall be recent (less than one year) and shall include the following information:
    - .1 The name of the registered laboratory or the ISO 9001 certified manufacturer laboratory;
    - .2 The complete results of the granulometric analysis, as prescribed in standard NQ 2560-114;
    - .3 The intrinsic characteristics and complementary test results, as defined in standard NQ 2560-114;
    - .4 If the materials are treated, indicate the proportion of added material as well as the treatment method used.

### **1.4 MATERIAL REJECTION**

- .1 A material with a certificate of conformity that has been accepted can nevertheless subsequently be refused if it does not meet the specified requirements, if the quality or the properties of the material delivered are not uniform, or even if the site performance of the latter is not satisfactory.
  - .2 In the event the rejection of a batch by the Departmental representative, the contractor removes and replaces at his costs the granular material of the rejected batch.
-



## 1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Comply with the criteria set out in section 01 74 21 – Construction Waste Management and Disposal.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

- .1 Materials of road base and stone pad according to standard NQ 2560- 114/2002:
  - .1 Granulometry: MG-20;
  - .2 Intrinsic characteristics: category 5;
  - .3 Fabrication characteristics: category e.
- .2 Material of road sub-base according to standard NQ 2560-114/2002:
  - .1 Granulometry: MG-112;
  - .2 Intrinsic characteristics (if stone): category 6;
  - .3 Intrinsic characteristics (if sand): category 3;
  - .4 Bearing capacity (if sand): CBR index after immersion, measured in compliance with the test described in standard ASTM D1883, shall be at least 30 after 100 % compaction of sample at according to standard ASTM D1557;
- .3 The granular materials incorporated to the asphalt are specified in section 32 12 17 – Asphalt Pavement.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- .1 Advise the Departmental representative at least 2 working days before the delivery of the materials.
  - .2 Fabrication:
    - .1 The granular materials shall originate from a sand pit or a quarry authorized by the *Ministère du Développement durable, de l'Environnement et des Parcs du Québec (MDDEP)*;
    - .2 All the materials of the same type shall originate from the same sand pit or a quarry;
  - .3 Handling:
    - .1 Transport the aggregates and handle them in such a way to prevent segregation, contamination and degradation.
  - .4 Stockpiling:
    - .1 Avoid as much as possible to stockpile the imported aggregates. If possible, transport and put in place the imported aggregates as the works progress.
    - .2 Unless indicated otherwise by the Departmental representative, put the aggregates in stockpiles on the site at the locations indicated by the latter.
    - .3 No stockpile shall be found at less than 10 m from walls of the training center.
    - .4 The aggregates shall be stockpiled on level ground and well drained, having a sufficient bearing capacity and stability to support the stockpiled materials, as well as the handling equipment.
-

- .5 Unless that the materials are stockpiled on an acceptable stabilized surface , the stockpile base shall be composed of a compacted sand layer of at least 200 mm thickness or of a geotextile in order to prevent the contamination of the aggregates. If sand is used, put the aggregates in stockpiles on the ground, but do not incorporate to the works the layer of material 200 mm in thickness at the base of the stockpile.
- .6 To avoid mixing of aggregates, sufficiently space the different aggregates stockpiles, or separate them by means of robust full height partitions.
- .7 It is forbidden to use mixed or contaminated materials. Remove and eliminate the rejected materials within 48 hours following their refusal, according to the instructions of the Departmental representative.
- .8 Stockpile the materials by forming uniform layers of thickness not exceeding 1,5 m.
- .9 Uniformly spot-dump by truck aggregates delivered to stockpile and build up stockpiles in compliance with the prescriptions.
- .10 It is forbidden to cone pile, or spill materials on each side of the piles.
- .11 Do not use conveying stackers.

### **3.2 CLEANING**

- .1 Clean the area where the aggregates have been stockpiled in order to leave the ground clean, well drained and free from any standing surface water accumulation.
- .2 Remove the unused aggregates from site.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 74 21 – Construction Waste Management and Disposal
- .2 Section 31 05 17 – Aggregate materials
- .3 Section 31 23 33 – Excavating, trenching and backfilling
- .4 Section 31 32 21 – Geotextiles
- .5 Section 32 11 19 – Granular sub-base and aggregate base course
- .6 Section 32 12 17 – Asphalt paving

### **1.2 REFERENCES**

- .1 Gouvernement du Québec :
  - .1 Ministère du Développement durable, de l'Environnement et des Parcs :
    - .1 Politique de protection et de réhabilitation des terrains contaminés (1999).
    - .2 Ministère des Transports du Québec :
      - .1 Norme LC 21-040, Analyse granulométrique.
  - .2 American Society for Testing and Materials (ASTM) :
    - .1 ASTM D698-[91(1998)], Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m<sup>3</sup>).

### **1.3 DEFINITIONS**

- .1 Excavation materials: materials originating from acceptable excavations and placed on the original ground or on a stripped ground, until the specified grade is obtained for the upper surface of the sub-grade.
- .2 Waste materials: materials that cannot be used as backfilling materials or as sub-grade backfilling materials, or excess materials.
- .3 Borrowed materials: materials obtained outside the property for backfilling or for other parts of the work.
- .4 Sub-grade: the sum of original soils or imported fill put in place from grading works and which support the road and its shoulders, and with the sub-grade line as an upper limit. This definition also applies to the original soils and imported fill under the top soil layer installed for the grass, under the stone pads, under the sidewalks, etc.

### **1.4 REGULATION**

- .1 Support and brace the excavations, protect the slopes and embankments, and execute all the works according to the most severe requirements of the provincial and municipal regulations in force.

### **1.5 TEST AND INSPECTIONS**

- .1 At the latest 48 hours before proceeding to the backfilling or filling with the approved material, inform the Departmental representative of the works to come.
  - .2 Do not begin the backfilling or filling works before approval by the Departmental representative of the proposed material for the execution of the works.
-

- .3 In the presence of the Departmental representative, before beginning the works, verify the status of the constructions which could be affected by the works, such as, the trees and the other vegetation elements, the grass, the fences, the service poles, the cables, the railroad tracks and the hard coated surfaces, the boundary marks and the existing benchmarks.

## **1.6 EXISTING CONDITIONS**

- .1 The general layout drawing shows the surface and underground utility conduits as well as the other buried works which the location is known.

## **1.7 PROTECTION MEASURES**

- .1 Protect the fences, the trees, the benchmarks, the buildings, the hard coatings, the surface and underground utility conduits that shall remain in place according to the drawings. Unless otherwise indicated, repair the damaged elements in such a way as to return them to their initial state or to a better condition.
- .2 Ensure the maintenance of access roads in order to avoid any accumulation of construction related debris on the roads.
- .3 Keep the excavations clean, exempt of standing water and loose materials.
- .4 When the ground can considerably vary in volume because of the fluctuations in its humidity content, cover and protect it to the satisfaction of the Departmental representative.

## **1.8 EXCESS EXCAVATION MANAGEMENT AND DISPOSAL**

- .1 Comply with the criteria set out in section 01 74 21 – Construction Waste Management and Disposal.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 The excavation materials shall be approved by the Departmental representative.
- .2 The excavation materials shall be able to be compacted, shall not contain more than 3 % in weight of organic materials, frozen clods, weeds, peat, roots, wood logs, stubs and other improper materials.
- .3 The excavation materials resulting from excavation or grading works can be used on site as filling materials if they meet the prescriptions of the present section.

## **PART 3 - EXECUTION**

### **3.1 GRASS AND TOP SOIL REMOVAL**

- .1 Remove the grass and the top soil before the beginning of the construction works.
  - .2 Remove the top soil up to the depth indicated. Avoid mixing the top soil with the subgrade soil.
  - .3 Relocate unused top soil to an onsite area as indicated by the Ministry Representative.
-

### 3.2 GRADING

- .1 Execute a rough grading according to the levels, profiles and indicated alignments, in consideration with the type of landscaping to execute on the surface.
- .2 Execute a rough grading to the following depths, measured below the specified final level.
  - .1 360 mm for pavement except as described at section 3.2.2.2;
  - .2 760 mm only for sections B and D.
- .3 During the rough grading, make the land slope in order to ensure a proper run-off water drainage.

### 3.3 EXCAVATION

- .1 Generalities
  - .1 Inform the Departmental representative if waste material of any nature are discovered during the pavements excavation works, and remove these materials up to a depth of at least 0,60 m under the infrastructure line. Dispose of these materials according to the prescriptions of section 01 74 21 – Construction Waste Management and Disposal, and according to the laws and regulations in force.
- .2 Drainage
  - .1 Shape the profiles, the summits, and the transversal slopes of the excavated areas in order to optimise the drainage of the run-off waters.
  - .2 Dig ditches as the works progresses to activate the drainage of run-off waters

### 3.4 BACKFILLING

- .1 Before depositing backfilling materials, stir the ground surface on a depth of 150 mm. To facilitate cohesion, maintain the backfilling materials and the existing ground surface at about the same degree of humidity.
- .2 Do not use frozen materials nor place backfilling materials on frozen surfaces, except in zones where this has been previously authorized.
- .3 Make a crowned profile surface throughout the works to ensure quick drainage of run-off waters.
- .4 Dry up all the low level zones before depositing materials.
- .5 Before backfilling, when required, place the geotextile membrane as described in the section 31 32 21 Geotextiles.
- .6 Place the materials on the entire width of the surface to cover in layers 150 mm thick after compacting.

### 3.5 COMPACTION

- .1 Break the ground clods in dimensions allowing a good compaction, and mix them in order to obtain uniform humidity content on the entire thickness of the layer.
  - .2 During the placing of materials, a compaction engine shall continuously circulate on each backfilling done. The compaction material shall allow obtaining layers of material having a density prescribed for the works. If not, either the material used shall be replaced, or the works shall be completed with the use of additional material.
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- .3 Compact the disturbed surfaces and the surfaces having received the backfilling materials until the dry maximum density has been reached, as determined according to standard ASTM D698 (AASHTO T99), being:
  - .1 95 % under the pavements.
- .4 Add water or aerate the materials according to the needs to give to the ground the required humidity content in order to obtain a compaction in compliance with the prescriptions. Water with the use of an equipment ensuring a uniform water distribution.

### **3.6 FINISHED SURFACE**

- .1 Profile the road sub-grade to a tolerance of 25 mm with respect to the calculated level prescribed.
- .2 Profile the sub-grade of non-road surfaces to a tolerance of 50 mm with respect to the calculated level prescribed.

### **3.7 PROTECTION**

- .1 Maintain the finished surfaces in good condition, in compliance with the prescriptions of the present section, up to the reception of works by the Departmental representative.

### **3.8 TESTS**

- .1 The inspection and the compaction tests of soils shall be executed by a laboratory designated by the Ministry.

### **3.9 EXCESS MATERIALS DISPOSAL**

- .1 Dispose of the excess materials and the materials improper for filling, grading or landscaping, off-site and in accordance with the specifications of the present section.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 SECTION CONTENT**

- .1 The work in this section includes the following:
  - .1 Digging for the preparation of the required sub-base and base course;

### **1.2 RELATED SECTIONS**

- .1 Section 01 74 21 – Construction Waste Management and Disposal
- .2 Section 31 05 17 – Aggregate Materials
- .3 Section 31 23 13 – Rough Grading
- .4 Section 32 11 19 – Granular Sub-base and Aggregate Base Course

### **1.3 DEFINITIONS**

- .1 Type of excavation:
  - .1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation including dense tills, hardpan, frozen materials, partially cemented materials and existing foundations and roadways that can be ripped and excavated with heavy construction equipment.
  - .2 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 m<sup>3</sup> and which can only be properly excavated once they have been broken by explosives or impact devices. Hardpan, indurated clay, till, frozen soil and stony soil are excluded from this category.
- .2 Backfilling materials:
  - .1 materials originating from acceptable excavations and placed on the original ground or on a stripped ground, until the specified grade is obtained for the upper surface of the sub-grade.
- .3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .4 Waste: surplus material or excavated materials that cannot be used for the present work.

### **1.4 REFERENCES**

- .1 Quebec laws, regulations and standards in force:
  - .1 Occupational Health and Safety Act;
  - .2 Construction Safety Code (R.S.Q., S-2.1, r.6);
  - .3 Occupational Health and Safety Regulations.

### **1.5 TEMPORARY PROTECTION**

- .1 Take the necessary measures to prevent any damage to adjacent structures, pipes, sidewalks, road surfaces, earthworks and to adjacent buildings.
  - .2 Fence off a temporary protective area around the worksite to prevent unauthorized individuals from entering the worksite.
  - .3 See section 01 61 00 – Access and temporary protective structures for specifications to follow for the equipment to install.
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## **1.6 PROTECTION OF EXISTING STRUCTURES**

- .1 Protect the bottom of excavations against any softening and should this occur, remove the softened soil and replace it with compacted type 2 backfill.
- .2 Protect the bottom of excavations against frost.
- .3 Take the necessary measures to eliminate the dust produced.
- .4 Protect existing facilities, buildings and services and the existing material located on the worksite in an appropriate manner so that they are not damaged during the work.
- .5 Never stockpile excavated material where it could impede the work, site drainage or the institution's operations.
- .6 Buried utilities and structures:
  - .1 Following contract attribution, a plan showing the underground obstacles will be provided to the Contractor to use as a reference.
  - .2 Size, depth and location of existing utilities and structures as indicated in the drawings are for guidance only. Completeness and accuracy are not guaranteed.
  - .3 Maintain and protect from damage water, sewer, gas, electric, telephone lines and other utilities and structures encountered in the excavation zone.
- .7 Existing buildings and surface features:
  - .1 Conduct, with Department representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, and paved roadways that must remain in place and may be damaged by the work.
  - .2 While performing the work, protect existing buildings and surface features that may be damaged. In the case of damage, immediately inform the Department representative and repair the damaged structures upon request. The damage may be repaired internally; however, the Contractor will still be charged for the cost of the repairs.
  - .3 If it is necessary to cut roots or branches in order to perform the excavation work, this work cannot be performed without the Department representative's approval.
- .8 Ensure the protection of layout benchmarks and geodesic monuments on the worksite.
- .9 Take any necessary precautions to prevent any damage to property and bodily injury.
- .10 Take proper precaution to protect manhole or sewer covers as well as minimizing the amount of material falling in.

## **1.7 HEALTH AND SAFETY**

- .1 Comply with municipal requirements and the Province of Quebec's Construction Safety Code (S-2.1, r.6) regarding safety standards for excavations and worker protection.

## **1.8 WASTE MANAGEMENT AND DISPOSAL**

- .1 Comply with the criteria set out in section 01 74 21.

## **1.9 CHOICE OF EXCAVATION METHODS**

- .1 The Contractor is solely responsible for the choice of excavation methods used. These methods must be submitted in advance to the Department representative for approval.
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## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Type 1 backfill: 20-0 gravel  
Clean crushed gravel or stone, hard, resistant and free of shale, clay and any friable, organic or deleterious materials;
- .2 Type 2 backfill: Class A sand  
Compactable soil, consisting essentially of granular materials, hard, resistant and non-plastic, such as MG-112 sand, gravel or crushed stone. The soil must be free of shale, clay and any friable, organic, deleterious or contaminated materials. The soil must be frost proof. The soil must not contain rocks greater than 100 mm in diameter.
- .3 Type 3 backfill: regular Class B soil  
All compactable and frost-proof materials may be used except for organic soils. Soil components must be mineral in nature and free of rocks of which any one dimension is greater than 150 mm, slag, ash, waste, sod or other harmful materials.

## **PART 3 - EXECUTION**

### **3.1 PRELIMINARY WORK**

- .1 At the beginning of work, remove obstacles, snow and ice from all surfaces to be excavated or backfilled within the limits indicated and/or needed to perform the work.
- .2 Carefully cut pavements along the specified boundaries of excavations with a saw so that surfaces break neatly and squarely.
- .3 If needed, the Contractor shall construct an appropriate work platform to transport heavy machinery to the worksite.

### **3.2 STOCKPILING**

- .1 Put aside the backfilling materials at areas stipulated by the Department representative. Stockpile granular material in order to prevent segregation.
- .2 Protect the backfilling material against contamination.

### **3.3 DEWATERING AND HEAVE PREVENTION**

- .1 Keep excavations free of water while work is in progress.
- .2 Protect open excavations against flooding and damage due to surface run-off.

### **3.4 EXCAVATION**

- .1 Notify the Department representative at least 48h prior to the start of excavation work and note the land's natural profile where required in the representative's presence.
  - .2 Execute the excavation work according to the layout, profiles, levels, cuts and dimensions indicated on the drawings in order to install and construct the requested structures.
  - .3 Pay special attention to underground infrastructures (existing tunnels, water supply and sewer systems, thrust blocks and other conduits).
  - .4 Dig according to precise lines and levels to minimize the amount of backfill needed.
  - .5 For trench excavation, unless otherwise authorized by the Department representative in writing, do not excavate more than 30 m of trench in advance of installation operations.
  - .6 Excavated and stockpiled materials must be deposited at a sufficient distance from the trenches.
-

- .7 Limit the work executed with heavy equipment to the immediate vicinity of trenches that have not been backfilled.
- .8 The bottom of excavations must be free of loose, soft or organic matter.
- .9 Once the excavations have been completed in an area, have them approved by the Ministry Representative.
- .10 Whenever digging was executed too deep, fill the unauthorized excavations with type 2 backfill.

### **3.5 BACKFILLING AND COMPACTION MATERIALS**

- .1 Consult sections 31 05 17 – Aggregate Materials, 31 23 13 – Rough Grading and 32 11 19 – Granular Sub-base and aggregate base course, for specifications regarding backfilling and compaction materials.

### **3.6 BACKFILLING**

- .1 The surfaces to be backfilled must be free from debris, snow, ice, water and frozen ground. The backfill material must not contain frozen pieces, ice, snow or debris.
- .2 Before backfilling, when needed, ensure installation of the geotextile membrane as described in section 31 32 21 - Geotextile.
- .3 Spread the backfill material in uniform layers not exceeding 150 mm in compacted thickness up to grades indicated. Compact each layer before spreading the next layer.

### **3.7 CLEANING**

- .1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects noted by the Department representative.
- .2 Replace the topsoil as directed by the Department representative.
- .3 Clean and reinstate areas damaged during work as directed by the Department representative.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 74 21 – Construction Waste Management and Disposal
- .2 Section 31 05 17 – Aggregate materials
- .3 Section 31 23 13 – Rough Grading
- .4 Section 31 23 33 – Excavating, trenching and backfilling
- .5 Section 32 11 19 – Granular sub-base and aggregate base course
- .6 Section 32 12 17 – Asphalt paving

### **1.2 REFERENCES**

- .1 *Gouvernement du Québec, ministère des Transports:*
  - .1 *Normes – Ouvrages Routiers, Tome VII – Matériaux.*
    - .1 *Norme 130101 « Géotextiles ».*

### **1.3 SUBMITTALS**

- .1 At least ten (10) days following the contract attribution, submit to the Departmental representative the required copies of the technical sheets for approval.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 During transportation and storage, protect the geotextiles against direct solar radiation, ultra-violet rays, excessive heat, mud, dust, debris and rodents.

### **1.5 PROTECTION MEASURES**

- .1 Prevent vehicles from circulating on the geotextile membrane.

### **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Comply with the criteria set out in section 01 74 21 – Construction Waste Management and Disposal.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Separation and filtration geotextile:
    - .1 Type III according to standard 13101 « Geotextiles » of the Quebec Ministry of transport;
    - .2 Unwoven, made of at least 85 % in weight of polypropylene or polyester;
    - .3 Width (if delivered in rolls): 3,5 m;
    - .4 Length (if delivered in rolls): 100 m;
    - .5 Thickness: 1,4 to 1,7 mm.
-

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- .1 Install the geotextile once the infrastructure is inspected and approved by the Departmental representative.
- .2 On level surfaces, install the geotextiles by unrolling them in the direction of the longest dimension of the area to cover and on sloped surfaces, put in place the geotextiles in continuous strips, starting from the bottom of the slope up to the foreseen upper limit.
- .3 Install the geotextiles in such a way as to obtain a uniform surface exempt of wrinkling, waviness and tension zones.
- .4 Overlap each geotextile strip on the previously installed strip on a width of 300 mm.
- .5 Prevent the displacement of the geotextiles and protect them against any damage or deterioration before, during and after the installation of the covering material.
- .6 Install the covering material within 6 hours following the installation of the geotextile.
- .7 Replace the damaged or deteriorated geotextiles to the satisfaction of the Departmental representative.
- .8 Install and compact the covering material as required in compliance with section 32 11 19 – Granular Sub-Base and Aggregate Base Course.

#### **3.2 CLEANING**

- .1 Remove the construction wastes from the site and dispose them in an ecological manner, in compliance to the requirements of the regulation.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 74 21 – Construction Waste Management and Disposal
- .2 Section 31 05 17 – Aggregate materials
- .3 Section 31 23 13 – Rough Grading
- .4 Section 31 23 33 – Excavating, trenching and backfilling
- .5 Section 31 32 21 – Geotextiles
- .6 Section 32 12 17 – Asphalt paving

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM):
  - .1 ASTM D698-[00a], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>);
  - .2 ASTM D1557 - [00], Test Method for Laboratory Compaction, Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>);
  - .3 ASTM D2922, Test Methods for Nuclear Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).
- .2 *Bureau de normalisation du Québec (BNQ)*:
  - .1 *NQ 2560-114/2002, Travaux de génie civil – Granulats.*
- .3 *Transports Québec – Laboratoire des chaussées (MTQ/LC)*:
  - .1 *LC 22-002, Détermination du facteur de correction de la teneur en eau des sols et des matériaux granulaires à l'aide d'un nucléo-densimètre.*
  - .2 *LC 22-003, Détermination de la compacité des sols et des matériaux granulaires à l'aide d'un nucléo-densimètre.*

### **1.3 SUBMITTALS**

- .1 Submit the documents according to the prescriptions of section 31 05 17 – Aggregate Materials.
- .2 At the latest 48 hours before proceeding to the installation of the pavement foundation, inform the Departmental representative of the works to come in order that the designated organism can make the compaction tests.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver the required aggregates as the works progresses. If required, put them in piles in compliance with section 31 05 17 – Aggregate Materials. Do not stockpile more than 10% of all the aggregates required.

### **1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Comply with the criteria set out in section 01 74 21 – Construction Waste Management and Disposal.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Sub-base materials :
  - .1 The material of the sub-base layer is a granular material of type MG-112 , in compliance with the prescriptions of section 31 05 17 – Aggregates, and shall originate from a sand pit or quarry authorized by the *ministère du Développement durable, de l'Environnement et des Parcs du Québec (MDDEP)*.
- .2 Base course materials :
  - .1 The material of the pavement foundation and the stone cushion layer is a crushed stone of type MG-20, in compliance with the prescriptions of section 31 05 17 – Aggregates, originating from a quarry authorized by the *ministère du Développement durable, de l'Environnement et des Parcs du Québec (MDDEP)*.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- .1 Ensure that no frozen material is put in place.
- .2 Put the material in place on a clean surface and not frozen, exempt of snow and ice.
- .3 Protect all manhole or sewer covers and ensure minimize materials falling in.
- .4 Use spreaders equipped with rulers or adjustable clearance guarantying the spreading of the material in uniform layers of the required thickness.
- .5 Spread the material on the entire width of the work to be done in uniform layers of 150 mm maximum thickness after compaction.
- .6 Remove and replace any part of a layer that there has been materials segregation during the installation.

### **3.2 LAYER THICKNESS**

- .1 Sub-base layer: 400mm after compaction, for sectors B and D only.
- .2 Base course layer: 300mm after compaction.

### **3.3 INSTALLATION**

- .1 Sub-base layer, sectors B et D only :
  - .1 Construct, at the indicated areas, the sub-base layer to the depth and prescribed level.
  - .2 Begin to spread the material of the sub-base on the crown of the road or on the highest side for single slope road.
  - .3 Install the granular materials by using methods that prevent segregation or degradation.
  - .4 Use spreaders equipped with rulers or adjustable clearance guarantying the spreading of the material in uniform layers of the required thickness.
- .2 Base course layer :
  - .1 Install the materials of the road base, once the road sub-base and the geotextile installation have been inspected and approved by the Departmental representative.
  - .2 Construct, at the indicated areas, the base course layer to the depth and prescribed level.
  - .3 Begin to spread the material of the base course on the crown of the road or on the highest side for single slope road.

- .4 Install the granular materials by using methods that prevent segregation or degradation.

### 3.4 COMPACTION

- .1 General :
  - .1 The compaction equipment shall be adequate to obtain materials having the density required for the present works.
  - .2 Profiler et cylindrer alternativement pour obtenir une couche de fondation unie, égale et uniformément compactée.
  - .3 Add, during the compaction, the necessary water to obtain the prescribed density.
  - .4 At the areas where it is impossible to use the compaction equipment, also called rolling equipment, compact the materials until the prescribed density is obtained with the help of mechanical tampon, while observing the vibration limit.
  - .5 Correct surface irregularities by stirring the material and then adding or removing material until the surface level is in compliance with the prescribed tolerances.
- .2 Sub-base layer :
  - .1 Compact the road base up to at least 95% of the maximum dry density, according to standard ASTM D1557, if it is crushed stone or sand containing gravel.
- .3 Base course layer :
  - .1 Compact the road base up to at least 95% of the maximum dry density, according to standard ASTM D1557.

### 3.5 TOLERANCES

- .1 Sub-base layer :
  - .1 The admissible deviation, concerning the sub-base layer, is plus or minus 20 mm with respect to the level and oblique profile prescribed; this plus or minus deviation cannot however be uniform throughout the base surface layer.
- .2 Base course layer :
  - .1 The admissible deviation, concerning the finished base layer, is plus or minus 10 mm with respect to the level and oblique profile prescribed; this plus or minus deviation cannot however be uniform throughout the base surface layer.

### 3.6 PROTECTION

- .1 Maintain the finished base layer in compliance with the prescriptions of the present section up to the installation of the following layer or until the reception of the works by the Departmental representative.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 74 21 – Construction Waste Management and Disposal
- .2 Section 31 05 17 – Aggregate materials
- .3 Section 31 23 13 – Rough Grading
- .4 Section 31 23 33 – Excavating, trenching and backfilling
- .5 Section 31 32 21 – Geotextiles
- .6 Section 32 11 19 – Granular sub-base and aggregate base course

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM):
  - .1 ASTM D698-[00a], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - .2 ASTM D2950, Standard Test for Density of Bituminous Concrete in Place by Nuclear Methods.
- .2 International Standards Organisation (ISO):
  - .1 ISO 9001:2000 « Quality management system ».
- .3 Gouvernement du Québec, Ministère des Transports:
  - .1 Normes – Ouvrages Routiers, Tome VII – Matériaux;
  - .2 Norme 4101 « Bitumes »;
  - .3 Norme 4202 « Enrobés à chaud formulés selon la méthode de formulation du Laboratoire des chaussées »;
  - .4 Norme 4105 « Émulsions de bitumes »;
  - .5 Laboratoire des chaussées (MTQ/LC);
  - .6 LC 26-040, Détermination de la densité brute et de la masse volumique des enrobés à chaud compactés;
  - .7 LC 26-045, Détermination de la densité maximale;
  - .8 LC 26-320, Détermination du pourcentage de vides dans les enrobés à chaud compactés;
  - .9 LC 26-500, Détermination du facteur de correction à utiliser pour déterminer la masse volumique *in situ* des enrobés à l'aide d'un nucléodensimètre;
  - .10 LC 26-510, Détermination de la masse volumique *in situ* des enrobés à l'aide d'un nucléo-densimètre.
- .4 Bureau de normalisation du Québec (BNQ):
  - .1 NQ 2560-114/2002, Travaux de génie civil – Granulats.

### **1.3 SUBMITALS**

- .1 At least 10 working days after the contract attribution, submit to the Ministry Representative, for each type of asphalt pavement:
    - .1 The identification and location of the asphalt plant;
    - .2 A copy of the registered certificate confirming that the quality system complies to the requirements of standard ISO 9001:2000 « Quality management systems»;
    - .3 A quality plan in compliance with standard MTQ 4202;
    - .4 A copy of the theoretical and final formulas of the formulated hot-mix asphalt according to the formulation method of the Laboratoire de chaussées du MTQ, which contains the information prescribed in standard MTQ 4202;
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- .5 The maximum calculated density value according to the MTQ LC 26-045 test method, on each of the 5 samples taken during the in-production evaluation of the theoretical formulas, as well as the average value;
- .6 The « Marshall » void percentage calculated according to the MTQ LC 26-320 test method, on each of the 5 samples taken during the inproduction evaluation of the theoretical formulas, as well as the average value, if the Marshall method is chosen to control in-production voids.
- .2 At least 10 working days after the contract attribution, submit to the Ministry representative, for each type of granular material used to fabricate the coatings:
  - .1 Identification and location of the quarry or sand pit;
  - .2 A conformity certificate of the materials after treatment (crushing, washing, adding, screening). The certificate shall include the following information:
    - .1 The name of the registered laboratory or the ISO 9001 certified manufacturer laboratory;
    - .2 The complete results of the granulometric analysis, as prescribed in standard NQ 2560-114;
    - .3 The intrinsic characteristics and complementary test results, as defined in standard NQ 2560-114;
    - .4 If the materials are treated, indicate the proportion of added material as well as the treatment method used.
- .3 At least 10 working days after the contract attribution, submit to the Ministry representative for each type of asphalt used for the foundation impregnation and to fabricate the coatings:
  - .1 The identification of the asphalt manufacturing plant and, if applicable, the identification of the storage and shipping company if it is different from the manufacturer.
  - .2 A copy of the registered certificate of the asphalt manufacturing plant, and, if applicable, of the storage and shipping company confirming that the quality system complies to the requirements of standard ISO 9001:2000 « Quality management systems »;
  - .3 A conformity certificate according to standard MTQ 4101.
- .4 Advise the Ministry representative at least 2 working days before the delivery of the materials.
- .5 Ensure to the Ministry representative, for sampling purposes, the access to the supply source and to the prepared materials as well to the site of delivery.

#### 1.4 QUALITY CONTROL

- .1 Materials and compaction are analyzed and tested by an expert and testing laboratory designated by the Ministerial Representative.
  - .2 If tests have to be repeated due to nonconformities, costs must be paid by the contractor.
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## 1.5 MATERIAL REJECTION

- .1 A material with a certificate of conformity that has been accepted can nevertheless subsequently be refused if it does not meet the specified requirements, if the quality or the properties of the material delivered are not uniform, or even if the site performance of the latter is not satisfactory.
- .2 The control parameters and the acceptance criteria are specified in the standards MTQ 4101 and 4202.

## 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Comply with the criteria set out in section 01 74 21 – Construction Waste Management and Disposal.

## PART 2 - PRODUCTS

### 2.1 MATERIAL

- .1 Single Asphalt coat :
  - .1 Type ESG-10 in compliance with the prescriptions of standard 4202 « Enrobés à chaud formulés selon la méthode de formulation du Laboratoire des chaussées » du ministère des Transports du Québec.
  - .2 The existing asphalt paving, large and small aggregates that contain slag and or blast furnace residue, cannot be used in any new bituminous mix.
  - .3 Conformity :
    - .1 The conformity or nonconformity decision will apply to a complete batch.
    - .2 The work is subdivided into batches of 1,000 tonnes each. The work for which the quantities involved are smaller than those of a batch are considered to form a batch.
    - .3 For work involving more than one batch, the quantities in tonnes, exceeding one batch or an exact number of batches, are considered to form a batch if they are equal to or greater than 100 tonnes; otherwise, they are considered to be part of the last complete batch.
    - .4 The asphalt mix will be sampled in situ at a frequency of one sample per 200 tonnes of asphalt mix according to test method LC 26-005 and the conformity tests will be at the Manufacturer's expense.
    - .5 In addition to meeting the requirements of these specifications, a batch is considered to conform by external control if, for the main characteristics, the deviation between the mean result obtained on the samples taken in this batch and the formula falls within the tolerable deviations ( $E_t$ ) indicated in the following table:

Main characteristic	TOLERABLE AND CRITICAL DEVIATIONS FROM THE FORMULA				
	E <sub>t</sub> for N = 1	E <sub>t</sub> for N = 2	E <sub>t</sub> for N = 3	E <sub>t</sub> for N = 4	E <sub>t</sub> for N = 5
% passing through the 80 µm sieve	1.7	1.2	1.0	0.9	0.8
<u>Granulometric total</u> ESG-10 and EC-10	30	22	18	16	14
<u>Asphalt content</u> EC-10, ESG-10	0.45	0.38	0.31	0.27	0.24
<u>Pavement compaction</u> EC-10, ESG-10	4.0	1.6	1.4	1.3	1.0

\* N = Number of samples

Note 1 For compaction, the tolerable and critical deviations are applied to the minimum requirement of 93%.

Note 2 The tolerable and critical deviations apply to the mean value of the batch in relation to the mix formula.

Note 3 The value of the deviations indicated is expressed as a percentage.

.6 Percentage of voids

.1 A batch will be considered to conform if the percentage of voids in the batch established according to standard LC 26-320 deviates less than 1.5% from the final asphalt mix formula.

.7 Other characteristics

.1 For asphalt mix formulated according the Laboratory's formulation method (standard 4202) to conform:

.1 The percentage passing the results of the analysis on the first sieve on which any retention is permitted must not be more than 3% lower than the minimum requirement indicated in Table 4202-1 of standard 4202, and the requirement of 100% passing through the next sieve up must be met, as stipulated in the same table;

.2 The percentage (%) of voids indicated in Table 4202-1 of standard 4202, on the gyratory shear press for each number of gyrations must be targeted or obtained.

.3 In the event that one of these criteria is not met, each sample which resulted in nonconformity with these criteria shall be analyzed individually in relation to the requirements mentioned in Table 4201-1 of standard 4201, in order to evaluate the prejudice, and the Ministerial Representative reserves the right to reject the work and to have it redone by the contractor.

.4 Any asphalt mix produced which does not satisfy the requirements stipulated in the plans and specifications shall be considered defective.

- .4 Proportioning of mixing formula:
  - .1 The proportioning of mixing formula shall be provided to the Ministerial Representative for approval.
  - .2 The mixing formula cannot be changed without the Ministerial Representative's approval. If the source of supply changes, a new mixing formula shall be approved by the Ministerial Representative.
- .2 Impregnation and adhesion bonding agent: Slow setting emulsified asphalt of weak viscosity in compliance with standard 4105 « Émulsions de bitumes » du ministère des Transports du Québec.
- .3 Aggregates: in compliance with standard NQ 2560-114/2002 « Travaux de génie civil – Granulats », Partie V, « Enrobés à chaud ».
  - .1 Intrinsic characteristics of coarse aggregate: category 3;
  - .2 Fabrication characteristics of coarse aggregate: category c.
  - .3 Intrinsic characteristics of fine aggregate: category 2;
- .4 Asphalt: class PG 58-28, according to standard 4101 « Bitumes » of the Quebec Ministry of Transport.

### **PART 3 – EXECUTION**

#### **3.1 EXECUTION PERIOD**

- .1 The execution period of asphalt pavement works is after the thaw as defined by the Quebec Ministry of Transport and before November 15<sup>th</sup>.
- .2 The asphalt mixes shall be prepared and placed under favourable weather conditions at an ambient temperature allowing production of a flexible pavement conforming to the requirements of these specifications.
- .3 It is forbidden to operate when the mixture of the aggregates affects the mix temperature or the speed of operations or when the base is soaked or covered with puddles or mud.
- .4 The temperature of the surface to be covered shall be at least 5°C with a rising trend. When the surface temperature falls below 5°C, no surface course shall be placed without written permission from the Ministerial Representative.
- .5 The storage temperature of the asphalt and mixing in the plant shall be less than or equal to the maximum temperatures indicated in the asphalt's certificate of conformity.

#### **3.2 ALIGNMENTS ET LEVELS**

- .1 All the work shall be performed in accordance with the alignments and levels indicated in the plans and details.
  - .2 Except where otherwise indicated, the final surface repair elevations shall be the same as the elevations of adjacent existing surfaces.
  - .3 If obstructions or other fortuitous circumstances not anticipated in the plans hinder the work to the extent of necessitating changes, the Ministerial Representative may require that the work be modified or moved accordingly.
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### 3.3 PREPARATION

- .1 When paving over existing asphalt surface, clean pavement surface.
- .2 When levelling course is not required, patch and correct depressions and other irregularities to approval of Ministerial Representative before beginning paving operations.
- .3 Before applying the pavement, apply the required prim and tack coats as specified in the present section.
- .4 Prior to laying mix, clean surfaces of loose and foreign material.

### 3.4 TRANSPORTATION ON MIX

- .1 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within range as directed by Ministerial Representative, but not less than 135 degrees C. It is forbidden to overheat an asphalt to compensate the cooling caused by transport, whatever the length of time.
  - .1 The decrease in temperature of the asphalt mixes between mixing and the time of placing in situ shall not exceed 15°C.
  - .2 Any mix not satisfying these requirements will be rejected.

### 3.5 FOUNDATION REPAIR AND PREPARATION

- .1 Before beginning the works, ensure that the road base is ready according to the prescriptions of section 31 23 13 – Rough Grading, and that the base is approved by the Ministry representative. If required, in order to make the repairs, the contractor shall scarify the existing road to a minimum depth of 100 mm to make the surface materials loose and homogenous and to allow shaping. The materials are spread and compacted according to the construction requirements of the road base, except that the repair layer can be of variable thickness according to the works and the repair profile to be done. The corrective measures are done at the costs of the contractor.
  - .2 The contractor shall spread an impregnation and bonding agent on the granular surface, and also on vertical contact surfaces of the edges, sidewalks and other structures, vertical surfaces and construction joints.
  - .3 It is forbidden to apply a bonding agent or to impregnate during rain, on a wet or frozen surface, or when the ambient temperature is less than the one recommended by the manufacturer. The installation temperature of the impregnation bonding agent on a granular surface shall meet the manufacturer recommendations.
  - .4 To facilitate the penetration of the impregnation bonding agent, the contractor shall scarify the granular surface to a minimum depth of 25 mm. After a waiting period of at least 30 minutes after the installation of the bonding agent, the granular surface is compacted to a minimum of 95 % of the maximum dry density intended for site compaction of road base materials.
  - .5 The bonding agent impregnation spreader shall be equipped with a flow meter allowing to control the application rate. The impregnation or bonding agent is uniformly applied with the use of a pressure manifold, at a rate of residual bitumen of 1,2 L/m<sup>2</sup>.
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- .6 The bond shall be entirely cured before proceeding to the installation of the pavement. The impregnated and bonding agent coated surface shall be covered in the same day if the pavement is opened to traffic. In all cases, the contractor shall take the necessary dispositions to avoid that the impregnation or bonding agent be spread on the adjacent surfaces already paved or on other surfaces which should not paved.

### **3.6 FINISHING COAT THICKNESS**

- .1 Asphalt :
  - .1 Single layer : type ESG-10, PG 58-28 a thickness of 60 mm;

### **3.7 ASPHALT CONCRETE INSTALLATION**

- .1 Obtain Ministerial Representative's approval of base and existing surface, tack coat and prime coat prior to placing asphalt.
  - .2 Mechanical spreading: The advance speed of a finisher shall allow the installation of an asphalt with a density and characteristics in compliance with the requirements of the present document.
  - .3 Place asphalt concrete to thicknesses, grades and lines as indicated.
  - .4 Spread and strike off mixture with self-propelled mechanical finisher.
    - .1 The self-propelled mechanical spreader shall be driven by a competent operator.
    - .2 The adjustments to the grader, the tampers, the distribution screws, etc. shall be verified regularly so that the texture of the mix is uniform, free of tears, deformations or grooves.
    - .3 The operating mode (stopping time, speed, etc.) of a mechanical spreader shall allow production of a pavement with conforming density and characteristics.
    - .4 When a single spreader is used, the mix shall be placed over a length not exceeding 200 m in hot weather and 50 m in cold weather. The Ministerial Representative may allow derogation from this rule and prescribe a more appropriate sequence, taking into account the thickness of the mix, the temperatures and the hourly production of the asphalt batching plant.
    - .5 When using pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by first paver. Work pavers as close together as possible and in no case permit them to be more than 30 m apart.
    - .6 The longitudinal joints shall be parallel to the road layout lines and shall not be superimposed. The longitudinal joints shall not be located under the normal passage of wheels. The installation of the asphalt is planned in order not to allow longitudinal joints to be completed the day after. All transversal or longitudinal joints with a temperature lower than 85 °C shall be brushed over with a uniform layer of bonding agent. All joints shall have the surface characteristics required for the asphalt layers.
    - .7 Maintain constant head of mix in auger chamber of paver during placing.
    - .8 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.
    - .9 Correct irregularities in alignment left by paver by trimming directly behind machine.
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- .10 Correct irregularities in surface of pavement course directly behind paver. Remove by shovel or lute excess material forming high spots. Fill and smooth indented areas with hot mix. Do not broadcast material over such areas.
  - .11 It is forbidden to broadcast materials on the surfaces to be repaired.
  - .12 Do not throw surplus material on freshly screeded surfaces.
  - .5 For inaccessible areas to the finisher, the asphalt is manually spread.
    - .1 The installation must be done with care.
    - .2 The coating is equally spread and distributed in a loose layer of uniform density by taking care to avoid segregation.
    - .3 Before compaction, the contractor shall verify the surface with a ruler and repair inequalities.
    - .4 It is forbidden to project the asphalt on the surface in a manner such that the aggregates fan out.
  - .6 Each layer shall have a uniform texture, without segregation and bleeding, shall be regular and comply to the transversal and longitudinal profiles must allow for a good drainage of surface water towards catchment points (stormdrain) without any water accumulation.
  - .7 Irregularities: Immediately after the installation of a layer and before starting the compaction, the surface is verified and the irregularities are repaired. The material accumulations shall be removed. The tooth marks and other depressions are graded and filled with hot asphalt.
  - .8 The profile of each layer shall not vary by more than 6 mm with respect to the specified profile. The thickness of the layer shall not vary by more than 6 mm with respect to the average thickness indicated by the rate of installation per square meter
  - .9 Provide heating equipment to keep hand tools free from asphalt. Control temperature to avoid burning material. Do not use tools at higher temperature than temperature of mix being placed. When hand tools are cleaned with oil, place the oil container in an area where it will not get contaminated.
  - .10 Surface characteristics of the asphalt layers: Each layer shall have a uniform texture, without segregation and bleeding, shall be regular and comply to the transversal and longitudinal profiles indicated on the drawings and specifications. After the final compaction of each layer, the Ministry representative verifies the layouts and the slopes. No irregularity or depression shall exceed 5 mm within 3 m.
  - .11 Any asphalt surface coat that does not conform to specifications must be rejected and redone with costs covered by the contractor. This includes the removal and disposal of the rejected materials.
  - .12 Adjust the infrastructure located in the pavement with respect to the final levels, as prescribed in the present section and according to the indications of the Ministry representative.
  - .13 Traffic shall be authorized on the freshly placed pavement only when the pavement temperature has cooled to below 50°C.
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### 3.8 COMPACTION

- .1 General :
    - .1 Around frames and covers as well as hard to access areas must be compacted with a hot iron.
    - .2 When using vibratory rollers, the contractor must pay particular attention not to damage underground or neighbouring structures and conducts; If there is any doubt about it, all vibration is forbidden. The compacting sequence must permit the production of a rolling surface and a conform material compaction.
    - .3 The asphalt pavement courses shall be between 92% and 98% of the course obtained according to standard LC 26-320. Rolling shall be performed until the mix has reached the requested density.
    - .4 All the asphalt pavement courses that do not conform to the minimum requirement of 93.0% of the maximum density after final compaction shall be considered nonconforming and must be removed and redone by the contractor at its own expense, until the desired results are obtained.
    - .5 Use static compaction for levelling courses less than 25 mm thick.
    - .6 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per meter of travel. For lifts less than 50 mm thick, impact spacing not to exceed compacted lift thickness.
    - .7 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.
    - .8 Operate roller slowly initially to avoid displacement of material.
    - .9 Operate roller and not exceed 5 km/h for breakdown and intermediate rolling for static steel-wheeled and pneumatic tired rollers. Do not exceed 9 km/h for finish rolling.
    - .10 Overlap successive passes of roller by minimum of 200 mm and vary pass lengths.
    - .11 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.
    - .12 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
    - .13 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
    - .14 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side. Ensure that all points across width of pavement receive essentially equal numbers of passes of compactors.
    - .15 When paving in echelon, leave unrolled 50 to 75 mm of edge which second paver is following and roll when joint between lanes is rolled.
    - .16 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.
    - .17 Rolling shall be completed before sundown. The Ministerial Representative may accept derogation from this rule if he considers that satisfactory precautions are taken.
  - .2 Breakdown rolling:
    - .1 Begin breakdown rolling with vibratory roller immediately following rolling of transverse and longitudinal joint and edges.
    - .2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.
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- .3 Operate breakdown roller with drive roll or wheel nearest finishing machine. When working on steep slopes or super-elevated sections use operation approved by Ministerial Representative.
- .4 Use only experienced roller operators.
- .3 Intermediate rolling:
  - .1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.
  - .2 Rolling to be continuous after initial rolling until mix placed has been thoroughly compacted.
- .4 Finish rolling:
  - .1 Accomplish finish rolling with two-axle or three-axle tandem steel wheeled rollers while material is still warm enough for removal of roller marks. If necessary to obtain desired surface finish, use pneumatic-tired rollers as directed by Ministerial Representative.
  - .2 Conduct rolling operations in close sequence.
- .5 Acceptance :
  - .1 If the average batch compaction value falls below the requirement, a reevaluation of compaction by means of core samples will be performed as described in the following clause.
    - .1 The Ministerial Representative sets a date for re-evaluation of compaction by means of one (1) core sample for each 200 tonnes of asphalt mix placed.
    - .2 The location of the core samples is determined at random. The core samples must be taken within 20 days after sending the notice to the contractor.
    - .3 The percentage of compaction of the pavement is the ratio of the gross density of the core sample to the average maximum density for the day found during control of receiving, multiplied by 100.
    - .4 The gross density tests of the core samples are performed in the laboratory mandated by the Corporation according to test method LC 26-040.
    - .5 The contractor may delegate an observer during sampling and performance of the tests. Any comment on a procedure considered to be defective must be provided on the spot, and any case of divergence must be brought to the attention of the Ministerial Representative.
    - .6 The costs inherent in this re-evaluation are at the contractor's expense.

### 3.9 JOINTS

- .1 General :
  - .1 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.
  - .2 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
- .2 Transverse joints:
  - .1 Offset transverse joint in succeeding lifts by at least 600 mm.
  - .2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.
  - .3 If planing is necessary to rework a joint, this operation shall be performed at the contractor's expense.

- .4 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints.
- .3 Longitudinal joints:
  - .1 Offset longitudinal joints in succeeding lifts by at least 150 mm.
  - .2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 100 degrees C prior to paving of adjacent lane.
    - .1 If cold joint cannot be avoided, cut back by saw cutting previously laid lane, by at least 150 mm, to full depth vertical face, and tack face with thin coat of hot asphalt of adjacent lane.
  - .3 Overlap previously laid strip with spreader by 25 to 50 mm.
  - .4 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with lute or rake.
  - .5 Roll longitudinal joints directly behind paving operation.
  - .6 When rolling with static or vibratory rollers, have most of drum width ride on newly placed lane with remaining 150 mm extending onto previously placed and compacted lane.
  - .7 Place the mix at the end of the day so as not to leave any longitudinal joints to be completed the next day.
- .4 Construct feather joints so that thinner portion of joint contains fine graded material obtained by changed mix design or by raking out coarse aggregate in mix. Place and compact joint so that joint is smooth and without visible breaks in grade. Location of feather joints as indicated.
- .5 Construct butt joints as indicated.

### 3.10 FINISH TOLERANCES

- .1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.
  - .2 The profile of each course shall not vary more than 6 mm from the simulated profile.
  - .3 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 3 m straight edge placed in any direction.
    - .1 The mix used for correction of depressions shall be such that the nominal diameter of the biggest particle will be smaller than the average depth of the depression.
  - .4 The surfaces of each course shall have a uniform texture, without segregation, be regular and conform to the prescribed routes and slopes.
  - .5 Any defective section shall be replaced or corrected to the satisfaction of the Ministerial Representative before he allows placing of another course or accepts the work.
  - .6 Cleaning of manholes, valve chambers, sumps, sidewalks and curbs.
    - .1 Immediately after placing an asphalt mix course, the contractor shall clean the sewer manholes, the sumps and the valve chambers of all debris accumulated during the work or found at the beginning of the work. The covers shall be cleaned and the sidewalks shall be free of asphalt burrs.
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### **3.11 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 true and even surface and compact immediately to specified density.
- .2 Repair areas showing checking, rippling, or segregation.
- .3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

### **3.12 DAMAGES TO EXISTING WORK**

- .1 The contractor must take every required precaution to protect existing asphalt pavement; the contractor is responsible for any damages and must repair them covering all associated costs
  - .1 When working on existing pavement :
    - .1 Saw the bituminous coat with the proper tool following straight lines;
    - .2 Be sure to use a wheel loader in order to minimize damage to the surface layer to preserve;
    - .3 It is forbidden to use crawler loaders or bulldozers on existing pavement;
    - .4 If the contractor refuses to comply with the previous requirement, the Ministry Representative might demand the pavement damages be repaired on the entire street width, at the contractor's expenses.
- .2 Every precaution must be taken by the contractor in order to protect existing concrete sidewalks and borders; He is responsible for any damages caused and must at his expenses perform all repairs that are deemed necessary.

**END OF SECTION**

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