Part 1 General

1.1 DEFINITIONS

.1 Corrected maximum dry density is defined as:

.1 $D = (F1 \times D1) + (0.9 \times D2 \times F2)$

.2 Where: D = corrected maximum dry density kg/m^3.

.1 F1 = fraction (decimal) of total field sample passing 4.75 mm sieve

.2 F2 = fraction (decimal) of total field sample retained on 4.75 mm sieve (equal to 1.00 - F1)

.3 D1 = maximum dry density, $kg/m^3$of material passing 4.75 mm sieve determined in accordance with Method A of ASTM D1557-00.

.4 D2 = bulk density, kg/m^3, of material retained on 4.75 mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127-88 (93).

.3 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253-00 dry method when directed by Engineer.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 32 11 23 – Aggregate base course.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D4791-99, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.1 "Loi sur la qualité de l'environnement (RLRQ, chapitre Q-2) ".

.1 "Règlement sur les carrières et sablières (Q-2, r. 7) ".

.2 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.

.3 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices

1.3 MEASUREMENT FOR PAYMENT

.1 Granular materials will be measured and paid as per section 32 11 23 – Aggregate base courses.

.2 The restoration of the aggregate supply source will be a lump sum payable on completion. No payments will be made before the submission of the certificate mentioned in 3.4.2 below.

1.4 DOCUMENTS/SAMPLES TO SUBMIT FOR APPROVAL/INFORMATION

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

.2 Technical sheet

.1 Submit product data and instructions and manufacturer's literature on aggregate. The technical data must include product characteristics, performance criteria, physical size, finish and limitations

.3 Sample

.1 Submit sample.

.2 Take necessary measures for the continuous sampling of aggregates by the Departmental Representative during their production.

.3 Provide Departmental Representative, for sampling, access to the source of supply and prepared materials.

.4 Rise of sampling stations at the exit of the conveyor for the preparation of aggregates for the Representative of the Ministry there may take representative samples. Stop the conveyor at the request of the Departmental Representative, to enable it to take a sample from one side to the other of the transported material.

.5 Provide a front end loader or other suitable device and, if necessary, the services of a specialist in sampling lots operator. Move the samples to a storage site by the Departmental Representative directives.

.6 Provide bags or containers for new or clean samples which are suitable to contain aggregates.

.7 Pay the sampling and testing of aggregates if they do not comply with the prescribed requirements.

.8 Ensure, at the location of production, the supply of water, electricity and propane gas for the departmental representative mobile laboratory.

.4 Documents/samplings to submit for durable conception.

.1 Construction waste management:

.1 Submit the waste management plan of construction waste established for the project, which should specify the requirements for recycling and recovery.

.2 Erosion and sediments control:

.1 Submit a copy of the erosion and sediment control plan conform to the competent authority.

1.5 TRANSPORT, STOCPILE AND HANDLING

.1 Transport and handling: the aggregate materials must be transported and handled in a manner to prevent segregation, contamination and degradation.

.2 Stockpile: the washed or excavated under water materials shall be piled in a manner to let the water runoff of the materials and to uniform the water content of the pile at least 24 hours.

Part 2 Products

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.

.2 Flat and elongated particles of coarse aggregate: to ASTM D4791.

.1 Greatest dimension to exceed five times least dimension.

.3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:

.1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.

.4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:

.1 Crushed rock.

.2 Gravel and crushed gravel composed of naturally formed particles of stone.

2.2 SOURCE QUALITY CONTROL

.1 Inform departmental representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing production.

.2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.3 Advise departmental representative 4 weeks in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

Part 3 Execution

3.1 EXAMINATION

.1 Conditions verification: insure that the condition was acceptable to remove the vegetal materials.

.1 Visually inspect surfaces and supports with the departmental representative.

.2 Immediately inform the departmental representative of any inacceptable condition founded.

.3 Begin to remove the vegetal materials only after make corrections of inacceptable condition and obtain the departmental representative approval.

3.2 PREPARATION

.1 Processing with vegetal materials removal

.1 The vegetal materials should not be manipulated when the materials is wet or frozen nor in any manner that could alter the soil structure.

.2 Remove the vegetal materials to the depth indicated by the departmental representative. Avoid mixing vegetal materials with subsequent layer materials.

.3 Stockpile or install vegetal materials at the location indicated by the departmental representative. The height of pile do not exceed 2 meters.

.4 Keep the vegetal materials for re-use in the re-naturalization of the supply source.

.2 Aggregate source preparation

.1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials.

.2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.

.3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.

.4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.

.5 Trim off and dress slopes of waste material piles and leave site in neat condition.

.6 Provide a silt fence or other means to prevent the contamination of watercourses or existing natural wetland.

.3 Processing of granulate

.1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.

.2 If necessary, a mixture of aggregates, including recycled materials that meet the physical requirements of the specifications, is allowed to provide the particle size, the particle shapes or percentage of crushed particles prescribed

.4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.

.5 If necessary, screening, crushing, washing, classify and treat aggregates with appropriate equipment complies with the requirements.

.6 Stockpiling

.1 Stockpile aggregates on site in locations as indicated unless directed otherwise by departmental representative. Do not stockpile on completed pavement surfaces.

.2 Stockpile aggregates in sufficient quantities to meet Project schedules.

.3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.

.4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.

.7 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by departmental representative within 48 h of rejection.

.8 Stockpile materials in uniform layers of thickness max 1.5 m.

.9 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.

.10 Do not cone piles or spill material over edges of piles.

.11 Do not use conveying stackers.

.12 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.3 CLEANING

.1 Progress Cleaning: made them clean in accordance with Section 01 74 11 – Cleaning.

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

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

.3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.4 Leave any unused aggregates in neat compact stockpiles as directed by departmental representative.

.5 Waste Management: separate waste materials for reuse / re-use and recycling in accordance with Section 01 74 21 - Construction-demolition waste management and disposal.

3.4 RE-NATIRALIZATION OF THE SUPPLY SOURCE

.1 At works completion, restore supply source to condition meeting requirements of authority having jurisdiction.

.2 At works completion, provide the Departmental Representative a letter from the local authorities certifying that the supply source or part thereof exploited to the project requirements was restored to the satisfaction of these.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 11 23 – Aggregate base courses.

1.2 MEASUREMENT PROCEDURES

.1 The base courses pulverization of existing roadway base courses will not be measured. The coast for that work must be included in the price of the new base courses.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify the conditions of existing roadway base courses.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with works only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 SCARIFYING AND RESHAPING

.1 When the aggregate layer for granular recharging is under 150mm depth, the contractor shall scarify surface to 150mm depth before proceeding with the granular recharging with MG-20b modified materials.

.2 The stone of 50mm and more came to surface from pulverization and unsuitable material should be removed and discarded.

.3 When the aggregate layer for granular recharging is greater than 150mm depth, the contractor directly proceed with the granular recharging with MG-20b modified materials without pulverization of existing roadway.

.4 O the graded area part of the runway strip and taxiway strip, the contractor directly proceed with the granular recharging with MG-20b modified materials without pulverization of existing roadway.

.5 Do not pulverize a surface more than the superficies can be profiled and compacted within a prior notice of 2 hours, that for the possibility of an urgent emergency interruption of works and the reopening for aircraft operations.

.6 The pulverized existing surfaces inside the period of one work shift shall be completely re-profiled and compacted before the beginning of the next daily period of aircraft operations.

.7 In the same work shift, do nor scarify surface more than can be possible to recharge with granular or reshaped before the end of the work shift.

.8 As required, blade and trim pulverized material as indicated by Departmental Representative relatively to required elevation and cross section.

3.3 COMPACTING

.1 Compact to minimum of 98% as per corrected maximum dry density.

.2 Shape and roll alternately to obtain smooth, even and uniformly compacted roadway surface.

.3 Apply water as necessary during compaction to obtain specified density.

.4 If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.

3.4 CLEANING

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

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

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

.3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.5 PROTECTION

.1 Protect and maintain reshaped surface in condition conforming to this Section until succeeding material is applied.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 01 74 21 – Construction/demolition waste management and disposal.

.3 Section 31 37 00 – Rip-Rap.

1.2 MEASUREMENT AND PAYMENT

.1 The geotextiles used in the contruction of rip-rap will not be measured. The coast for that works must be included in the works where geotextile is required.

1.3 REFERENCES

.1 ASTM International

- .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM D4491-99a(2009), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- .3 ASTM D4595-09, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
- .4 ASTM D4716-08, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
- .5 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-4.2 No. 11.2-2004, Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
- .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
  - .1 No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.
  - .2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.
  - .3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
  - .4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
  - .5 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

.3 CSA International

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit copies of mill test data and certificate at least 4 weeks prior to start of Work.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with this Section and with manufacturer's written instructions.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Sort waste to re-use or recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard and packaging material for recycling in accordance with Waste Management Plan.

Part 2 Products

2.1 MATERIAL

.1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.

.1 Width: 3.5 m minimum.

.2 Length: 50 m minimum.

.3 Composed of: minimum 85% by mass of polypropylene and/or polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 60 days.

.2 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/$m^2$to CAN/CSA G164.

.3 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

.4 Physical properties:

.5 Physical and hydraulic properties:

.1 For use in rip-rap;

.1 Thickness: to CAN/CGSB-148.1, No.3, minimum 5.8 mm.

.2 Grab tensile strength and elongation: to CAN/CGSB-148.1, No.7.3.

.3 Breaking force: minimum 2500 N, wet condition.

.4 Elongation at future: 65-105%.

.5 Filtration opening size (FOS): 40-70 micron to CAN/CGSB-148.1 No.10.

Part 3 Execution

3.1 INSTALLATION

.1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated.

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.4 Overlap each successive strip of geotextile 600 mm over previously laid strip.

.5 Pin successive strips of geotextile with securing pins as per manufacturer recommandations

.6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.7 After installation, cover with overlying layer within 4 h of placement.

.8 Replace damaged or deteriorated geotextile to approval of departmental representative.

.9 Install rip-rap stone as per section 31 37 00 – Rip-rap.

3.2 CLEANING

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

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

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Section 31 32 19.01 - Geotextiles.

1.2 MEASUREMENT PROCEDURES

.1 Measure rip-rap in square metres of material placed. The price must included surface preparation, the supply and installation of the geotextile.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C144-99, Standard Specification for Aggregate for Masonry Mortar.

.2 ASTM C618-00, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

.2 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.

.2 CAN/CSA-A3000-98, Cementations Materials Compendium.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Collect and separate plastic in accordance with Waste Management Plan.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Fold up metal banding, flatten and place in designated area for recycling.

.5 Divert left over aggregate materials from landfill at the location indicated by the departmental representative.

.6 Divert left over hardened cement materials from landfill to local quarry for reuse as approved by the departmental representative.

.7 Divert left over geotextiles at the location indicated by the departmental representative.

Part 2 Products

2.1 STONE

.1 Hard, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended:

.1 Hand placed rip-rap:

.1 Minimum size of individual stones; 100mm, and maximum size; 200mm .

.2 Supply rock spalls or cobbles to fill open joints.

2.2 GEOTEXTILE FILTER

.1 Geotextile: in accordance with Section 31 32 19.01 - Geotextiles.

Part 3 Execution

3.1 PLACING

.1 When rip-rap must be realized on a slope, a trench shall be excavated at the extremity to firmly anchor the geotextile.

.2 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.

.3 Place geotextile on prepared surface in accordance with Section 31 32 19.01- Geotextiles and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile not permitted.

.4 Place rip-rap to thickness and details as indicated.

.5 Place stones in manner approved by the departmental representative to secure surface and create a stable mass. Place larger stones at bottom of slopes.

.6 Hand placing:

.1 Use larger stones for lower courses and as headers for subsequent courses.

.2 Stagger vertical joints and fill voids with rock spalls or cobbles.

.3 Finish surface evenly, free of large openings and neat in appearance.

END OF SECTION