

## **PART 1        GENERAL**

### **1.1        RELATED REQUIREMENTS**

- .1        Section 31 23 33.01 – Excavation, Trenching and Backfill.

### **1.2        REFERENCES**

- .1        ASTM D 4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .2        Ministère des Transports du Québec
  - .1        Cahier des charges et devis généraux (CCDG), dernière version.
  - .2        Norme 1101, Classification des sols, dernière version;
  - .3        Norme 2101, Granulats, dernière version;

### **1.3        ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Allow continual sampling during production.
- .3        Provide Departmental Representative with access to source and processed material for sampling.
- .4        Pay cost of sampling and testing of aggregates which fail to meet specified requirements.
- .5        Departmental Representative Departmental Representative .1        The crush stone (0-5 mm). The cost of the analysis is the expense of the contractor.
- .3        Departmental Representative .1        The stabilizing product.

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

- .1        Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.

## PART 2 PRODUCT

### 2.1 MATERIALS

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D4791.
- .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.
  - .2 Reclaimed asphalt pavement.
  - .3 Reclaimed concrete material.
- .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.
- .5 Type 1 and 2 backfill:
  - .1 Type 1: MG-20:
  - .2 Type 2: MG-112 or CG-14 as indicated in specification:
  - .3 Table :

Sieve Size	% Passing	
	Type 1	Type 2
112 mm	-	100
31.5 mm	100	-
20 mm	90 – 100	-
14 mm	68 – 93	-
5 mm	35 – 60	35 – 100
1.25 mm	19 – 38	-
0.315 mm	9 – 17	-
0.080 mm	2 – 7	0 – 10

- .4 CG-10 stone dust (concrete paving cushion)

Sieve Size	% passing CG-10
10 mm	100
5 mm	78 – 100
2.5 mm	-
1.25 mm	-
0.630 mm	-
0.315 mm	-
0.160 mm	4 – 25
0.080 mm	0 – 10

## **2.1 MATERIALS (cont'd)**

- .6 Type 3: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials. Organic soil or soil containing organic matter, contaminated soil or containing waste or frozen parts are excluded.

- .7 Stone dust: crushed stone (5-0 mm), limestone or granite stone dust spread according to the following table:

Screen size	Screen percentage
10 mm	100
5 mm	95 – 100
2.5 mm	75 – 80
1.25 mm	55 – 65
0.63 mm	40 – 50
0.35 mm	25 – 35
0.16 mm	20 – 25
0.08 mm	10 – 17

Contractor must provide laboratory analysis to Departmental Representative for approval and cover cost.

- .8 Stabilizer stabilizing product, organic powder stabilizer type and suitable for the work to be performed.

## **2.2 SOURCE QUALITY CONTROL**

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 2 weeks minimum before starting production.
- .2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .3 Advise Departmental Representative 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 PREPARATION**

- .1 Aggregate source preparation:
- .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
- .2 Blend aggregates, as required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.
- .1 Use methods and equipment approved in writing by Departmental Representative.

### **3.1 PREPARATION (cont'd)**

- .2 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
- .3 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
- .4 Stockpiling:
  - .1 Stockpile aggregates on site in locations as indicated. 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.
  - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
  - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.
  - .7 Stockpile materials in uniform layers of thickness as follows:
    - .1 Maximum 1.5 m for coarse aggregate and base course materials.
    - .2 Maximum 1.5 m for fine aggregate and sub-base materials.
    - .3 Maximum 1.5 m for other materials.
  - .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
  - .9 Do not cone piles or spill material over edges of piles.
  - .10 Do not use stacking conveyors.
  - .11 Do not allow ice and snow to mix with the materials in winter months.

### **3.2 STONE DUST SURFACE**

- .1 Install stone dust on prepared foundation. Spread evenly to indicated compacted thickness as indicated on drawings.
- .2 Water abundantly to soak entire depth with low pressure to prevent disturbing surface. It is important to completely saturate to the full depth at a rate of 45 litres per square metre. Quantity may vary depending on ambient humidity. Conduct tests to ensure entire depth is wet.
- .3 When water is evacuated and surface remains humid (approximately 6 to 24 hours), compact with one tonne minimum roller. Do not use vibrating plate or roller.
- .4 Finished surface must be flexible, uniform and solid with no cracks or stratification. When dry, the compacted material must be firm with no spongy areas nor loose material. Loose material is indicative of a poor mix or lack of water. Test area by adding water, allowing it to sink in and compact again. Mix will be refused where imperfections persist. Non-compliant surfaces must be replaced with a new mix.
- .5 Finished surface must be regular, free of imperfections and follow slopes and profiles required for adequate drainage of surface water, to the Departmental Representative satisfaction.

### **3.3 STONE DUST SURFACE WITH ORGANIC STABILIZER**

- .1 For surfaces indicated on plan only, the Contractor must uniformly incorporate the organic powder with the dry stone dust in the proportions recommended by the manufacturer, i.e., approximately 196 grams per square metre (1 kg to cover 5.11 sq. m.) and more. Use concrete mixer to mix stone dust/powder mix.
- .2 Apply in a single 85 mm compacted layer.
- .3 Abundantly water to fully soak through stone dust layer using low pressure to prevent disturbing trail surface. It is important to fully saturate layer as water activates stabilizing product.
- .4 While surface is still damp, level surface to create slope, flexible, uniform and solid with no cracks or stratification.
- .5 Compact using 1.5 tonne grass roller. Do not using vibrating plate.
- .6 Loose non-cohesive material is indicative of poor granulometry or compaction. Finished surface must be free of depressions where water can accumulate and enable run-off without erosion.

### **3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .3 Leave any unused aggregates in neat compact stockpiles as directed by Departmental Representative.

**END OF SECTION**