

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International

1.2 SOURCE APPROVAL

- .1 Inform the Departmental Representative of proposed source of aggregates and provide access for sampling prior to commencing production.
- .2 Provide test results as required to the Departmental Representative.
- .3 If, in opinion of the Departmental Representative, materials from the 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.
- .4 Acceptance of a material at source does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory.

1.3 MEASUREMENT FOR PAYMENT

- .1 Aggregate source preparation, processing and stockpiling will be measured in tonnes in place of aggregate actually incorporated and accepted into the Work. The unit price shall include materials including aggregate source preparation, processing, stockpiling, loading, hauling, QC testing and all work incidental thereto.
- .2 No measurement will be made for: unnecessary aggregate produced beyond quantities established; surplus aggregate not incorporated into the work.

1.4 PRODUCTION SAMPLING

- .1 In addition to Contractor's own sampling, to be carried out under the MSTP (Materials Sampling and Testing Program), aggregate will be subject to sampling by QA during production and the Work.
- .2 Install adequate sampling facilities at discharge end of production conveyor, to allow the Departmental Representative to safely obtain representative samples of items being produced. Stop conveyor belt when requested by the Departmental Representative to permit full cross section sampling.
- .3 Provide the Departmental Representative with ready access to source and processed material for purpose of sampling and testing.
- .4 Bear the cost of sampling and testing of aggregates which fail to meet specified requirements.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Allow continual sampling by Departmental Representative during production.
 - .2 Provide Departmental Representative with access to source and processed material for sampling.
 - .3 Install sampling facilities at discharge end of production conveyor, to allow Departmental Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by Departmental Representative to permit full cross section sampling.
 - .4 Provide front end loader or other suitable equipment including trained operator for stockpile sampling as necessary. Move samples to storage place.
 - .5 Supply new or clean sample bags or containers according appropriate to aggregate materials.
 - .6 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.
- .3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

Part 2 roducts

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.
 - .1 Greatest dimension to exceed 5 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.
 - .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.
 - .3 Light weight aggregate, including slag and expanded shale.
 - .4 Reclaimed asphalt pavement.
 - .5 Reclaimed concrete material.

2.2 SOURCE QUALITY CONTROL

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 4 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 4 weeks minimum 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 Verification of Conditions: verify that conditions are acceptable for topsoil stripping.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with topsoil stripping. only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Topsoil stripping:
 - .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
 - .2 Before commencement of topsoil stripping, review locations with Departmental Representative.
 - .3 Stockpile in locations as indicated and as shown on Drawings. Stockpile height not to exceed airport obstacle clearance heights.
- .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. Where clearing is required, leave screen of trees between cleared area and roadways as directed.
- .2 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
- .3 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.
- .4 Trim off and dress slopes of waste material piles and leave site in neat condition.
- .5 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .3 Processing:
 - .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 Methods and equipment used must be reviewed by Departmental Representative prior to use.
 - .3 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
 - .4 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
 - .5 Use only equipment with prior review by Departmental Representative.
- .4 Handling
 - .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
- .5 Stockpiling:
 - .1 Stockpile aggregates on site in locations as indicated on the Drawings. 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 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 conveying stackers.
- .11 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: 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 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Leave any unused aggregates in neat compact stockpiles.
- .5 Waste Management: separate waste materials for recycling.
- .6 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Runway and taxiway shoulder grading using asphalt millings or granular base will be measured in square metres of material actually placed by the Departmental Representative. The unit price includes survey, layout, hauling, placing, spreading, grading and compacting asphalt millings from the designated stockpile location. The supply and stockpiling of granular base material are paid separately.
- .2 Brush clearing and vegetation removal for airfield ditch cleaning will be measured by the Departmental Representative in square meters of ditch area actually cleared prior to the start of the clearing work. The unit price includes survey, layout, hauling, brush and vegetation removal and disposal off-site.
- .3 Airfield ditch excavation, re-grading and re-shaping of drainage ditches will be measured and paid by square meter of area actually re-graded and shaped by the Departmental Representative. The unit price includes survey, layout, excavation, placement, compaction required for re-grading and re-shaping of existing material.
- .4 Airfield ditch shaping and re-grading will be measured in cubic metres calculated from cross sections taken in areas of excavation by the Departmental Representative. The unit price includes survey, layout, ditch fill placement, compaction required for re-grading and re-shaping of using material from designated stockpile or area of excavation.
- .5 No separate payment will be made for:
 - .1 Stripping.
 - .2 Dust control.
 - .3 Maintenance of the work area and haul roads.
 - .4 Watering, drying and compacting.

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C117, Standard Test Method for Materials Finer Than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

1.3 DEFINITIONS

- .1 Excavation classes: 2 classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Common Excavation: excavation of materials of whatever nature, which are not included under definition of rock excavation, including dense tills, hardpan and frozen materials.
 - .2 Unclassified excavation: excavation of deposits of whatever character encountered in work. action is to be made between cohesionless and cohesive soil.
- .2 Compaction classes: two classes of soil are recognized for compaction purposes; cohesionless and cohesive soil:
 - .1 Cohesionless soil:
 - .1 Soils which have less than 20% passing 0.075 mm sieve, when tested to ASTM C117, regardless of plasticity of fines.
 - .2 Soils containing between 20% to 50% passing 0.075 mm sieve and having liquid limit less than 25 and plasticity index less than 6 when tested to ASTM D4318.
 - .2 Cohesive soil: soil not having properties to be classified as cohesionless.
- .3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .4 Waste material: excavated material unsuitable for use in work or surplus to requirements.
- .5 Borrow material: material obtained from locations outside area to be graded and required for construction of fill areas or for other portions of work.
- .6 Pavement structure: combination of layers of unbound or stabilized granular sub-base, base, and asphalt or concrete surfacing.
- .7 Subgrade elevation: elevation immediately below pavement structure.
- .8 Unsuitable materials:
 - .1 Weak and compressible materials under pavement areas.
 - .2 Frost susceptible materials under pavement areas.
 - .3 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM C136, ASTM D422: Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	% passing
2.00 mm	100
0.10 mm	45-100
0.02 mm	10-80
0.005 mm	0-45

- .2 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

Part 2 Products

2.1 MATERIALS

- .1 Fill materials: on site materials in designated stockpile locations, or common excavation or borrow excavation areas with prior review by Departmental Representative.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for grading.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 EXCAVATING

- .1 General:
 - .1 Advise Departmental Representative minimum of 7 days in advance of excavation operations for initial cross sections to be taken.
 - .2 Excavate to lines, grades, elevations and dimensions as indicated in the Drawings and reviewed by the Departmental Representative.
 - .3 Ensure drainage of excavated areas and maintain crowns and cross slopes to provide surface drainage.
 - .4 Notify Departmental Representative whenever unsuitable materials are encountered in cut sections, remove unsuitable materials as required and replace with material reviewed by Departmental Representative to depth and extent as directed.
 - .5 Treat ground slopes at grade points, where subgrade is on transition from excavation to embankment or earth to rock, in accordance with Transport Canada's guidelines for "Cut and Fill Construction Methods at Grade Points" as directed by Departmental Representative.
 - .6 Dispose of waste material as directed by Departmental Representative.

- .2 Borrow excavation:
 - .1 Obtain from borrow areas located on airport property, fill material required in excess of quantities available from cut areas.
 - .1 Departmental Representative will designate location and extent of borrow areas, and allowable depth of cutting.
 - .2 Shape edges of borrow areas on slopes of 1 vertical to 5 horizontal and provide drainage as directed by Departmental Representative.
 - .2 Trim and leave borrow pits in condition to permit accurate measurement of material removed.
- .3 Do not disturb foundation materials of adjacent pavements or structures which are to remain in place.

3.3 DITCH RE-GRADING

- .1 Before taking material from borrow areas, completely use suitable materials removed from excavation.
- .2 Do not place frozen material nor place material on frozen surfaces.
- .3 Material containing less than 25% by volume of rock fragments larger than 100 mm maximum dimension:
 - .1 Place and compact to full width in uniform layers 200 mm maximum loose thickness.
 - .1 Departmental Representative may authorize thicker lifts if specified compaction can be achieved.
 - .2 Place using thicker layers only after receipt of written approval from Departmental Representative.
 - .2 Compact fill materials, in non-pavement areas, minimum 90 % of corrected maximum dry density.
- .4 Do not place stones and boulders exceeding 50 mm maximum dimension within 100 mm of finished surface in graded areas.

3.4 FINISHING AND TOLERANCES

- .1 Blade finished surfaces in cut and fill areas free from ruts, depressions, rocks in excess of 10 mm and debris.
- .2 Roll finished surfaces to tight dense condition.
- .3 Finish graded area within 30 mm of design elevations, but not uniformly high or low.
- .4 Surfaces free from depressions exceeding 30 mm in 5 m.

3.5 PLACING TOPSOIL

- .1 Place topsoil after Departmental Representative has reviewed subgrade.
- .2 Spread available depth of topsoil. Remove surface stones, roots and other debris and leave surface in uniform condition.

3.6 MAINTENANCE

- .1 Maintain finished surfaces in a condition in accordance with this Section until succeeding material is applied and reviewed by Departmental Representative.

3.7 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:
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION