

## 1.0 GENERAL

### 1.1 EXTENT OF TOPSOIL AND SUBSOIL PLACEMENT

- .1 Topsoil placement is required on exposed finished excavation surfaces, finished fill surfaces, ground areas affected by the Work, and other areas as specified in the Contract Documents or as designated by the Owner or Engineer of Record.
- .2 Subsoil placement as required on prepared surfaces as specified in the Contract Documents or as directed by the Owner or Engineer of Record. Subsoil removed from the Downtown Dike project location should be assumed to be waste soil and is to be disposed of as specified within Section 02332 – Waste Fill Placement. Subsoils from the Downtown Dike location may also be used for surficial grading above the Impervious Fill Zone 1A material, in areas outside of the dike footprint and where grade supported structures are not proposed to be installed.
- .3 The Owner or Engineer of Record may adjust the placement thickness of Topsoil and/or Subsoil to best utilize the available materials.

### 1.2 REFERENCES

Provide Topsoil and Subsoil placement in accordance with the following standards (latest revision) except where specified otherwise.

- .1 Soil Quality Criteria Working Group, Soil Reclamation Subcommittee, Alberta Soils Advisory Committee, Alberta Agriculture, March 1987 – Reprinted November 1993, Conservation and Development Branch, Alberta Agriculture
  - .1 Soil Quality Criteria Relative to Disturbance and Reclamation
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>))
- .3 Alberta Transportation
  - .1 Field Guide for Erosion and Sediment Control available at:  
[www.transportation.alberta.ca](http://www.transportation.alberta.ca)
  - .2 Post-Disturbance Reclamation Criteria and Assessment Procedures for Borrow Excavations for Road Construction.

### **1.3 SUBMITTALS**

Provide the following submittals:

- .1 All imported Topsoil materials are to be deemed suitable for use as a growing medium prior being imported to the Downtown Dike project location. The Contractor is required to engage an independent agrologist or soil specialist to determine that the imported topsoil materials are suitable for the intended use. A summary report from the Contractor and soil specialist is to be provided to the Owner or Engineer of Record, a minimum of 7 days prior to purchase and importation of the material to the Downtown Dike project location.

### **1.4 POST-DISTURBANCE ASSESSMENT BY THE CONTRACTOR**

- .1 Prior to placement of any imported topsoil, the contractor is required to engage an independent agrologist or soil specialist to determine that the imported topsoil materials are suitable for the intended use. A summary report from the contractor and soil specialist is to be provided to the Town of Drumheller and Engineer of Record, a minimum of 7 days prior to purchase and importation of the material to the Downtown Dike project location.
- .2 Complete the post-disturbance assessments within 7 days of the completion of the reclamation work including Topsoil placement.
- .3 Repair any deficiencies and repeat the post-disturbance assessment at no cost to the Town of Drumheller.

## **2.0 PRODUCTS**

### **2.1 MATERIALS**

Provide materials in accordance with the following:

- .1 Topsoil: Topsoil (as defined in Section 02234 – Topsoil and Subsoil Stripping) attained during stripping operations will not require approval from an independent agrologist or soil specialist prior to reuse. Only imported topsoil will require approval from a soil specialist (hired by the contractor) prior to utilization at the Downtown Dike location. The Owner or Engineer of Record will inspect the stockpile of stripped topsoil for contamination before being reused on site.
- .2 Subsoil: Subsoil specifications as defined in Section 02234 – Topsoil and Subsoil Stripping. Provide Subsoil from stockpiles of materials produced from required stripping operations and stockpiles of Owner supplied Subsoil. Subsoil removed from the Downtown Dike project location should be assumed to be waste soil and is to be disposed of as specified within Section 02332 – Waste Fill Placement. Subsoils from the Downtown Dike location may also be used for surficial grading in areas above the Impervious Fill Zone 1A material, outside of the dike footprint and where grade supported structures are not proposed to be installed.

### **3.0 EXECUTION**

#### **3.1 PREPARATION - GENERAL**

- .1 Locate and protect utility lines, fencing, survey reference points, instrumentation, structures, culverts, and all other items before commencement of the Work.

#### **3.2 PREPARATION –STOCKPILED TOPSOIL**

- .1 Control and eliminate all perennial grass and weeds including their root systems until native stockpiled topsoil is required for use. Stockpiled topsoil shall be reasonably free of all perennial grass and weed growth before being placed and spread on site.
- .2 Perform weed control, as necessary, in accordance with relevant government chemical pesticide application legislation. Obtain the Owners' approval for all pesticide applications.
- .3 Submit detailed pesticide applicator's log for verification after each application of approved pesticide.
- .4 Imported topsoil will require approval from an independent agrologist or soil specialist prior to delivery to site (responsibility of the contractor).

#### **3.3 SUBSOIL PLACEMENT**

- .1 Subsoil removed from the Downtown Dike project location should be assumed to be waste soil and is to be disposed of as specified within Section 02332 – Waste Fill Placement. Subsoils from the Downtown Dike location may also be used for surficial grading in areas above the Impervious Fill Zone 1A material, outside of the dike footprint and where grade supported structures are not proposed to be installed.
- .2 Where Subsoil is to be utilized at the Downtown Dike location, remove snow, ice, excess water, large rocks, and deleterious materials from surfaces to receive the Subsoil. Do not commence Subsoil placement until the Owner has inspected the prepared surface areas. Rectify any defects identified by the Owner or Engineer of Record.
- .3 At the Downtown Dike location, subsoil can be utilized for surficial grading above the Impervious Fill Zone 1A, in areas outside of the dike footprint and where grade supported structures are not proposed. The combined subsoil thickness is not to exceed 300 mm at any location. The Subsoil is to be placed to a uniform thickness on a prepared surface prior to placement of Topsoil.
- .4 Where utilized at the Downtown Dike location, place Subsoil in an unfrozen condition, and spread and compact the material to obtain a minimum Standard Proctor Density of 92% in accordance with ASTM D698. Alternately, the Subsoil can be compacted by performing a minimum of 4 passes utilizing a minimum 10-ton compactor. A single pass means the complete coverage of the fill lift. Overlap required for complete coverage will not be considered to provide any portion of a subsequent or previous pass. The Owner or Engineer of Record can increase or decrease the number of passes required based on the equipment being utilized by the contractor, and the condition of the fill material and subgrade at the time of placement.

### **3.4 SUBGRADE/FILL AREA PREPARATION PRIOR TO TOPSOIL PLACEMENT**

- .1 Remove excess water from subgrade and/or fill surfaces.
- .2 Grade the subgrade and fill areas to eliminate uneven areas and to provide proper drainage.
- .3 Remove roots, rocks greater than 80 mm in diameter, debris, and other deleterious materials that are on top of the subgrade or fill soils.
- .4 Disc/scarify the subgrade and fill areas when lumps larger than 80 mm are prevalent.

### **3.5 TOPSOIL PLACEMENT**

- .1 Do not commence Topsoil placement until the Owner has inspected the prepared subgrade. Rectify any defects as required by the Owner.
- .2 Topsoil placement will not be allowed to proceed, if in the opinion of the Owner, there is inadequate soil moisture after seeding for germination and there will be insufficient time left in the growing season to allow the vegetation to root and thereby minimize soil erosion.
- .3 Place Topsoil in an unfrozen condition, in dry, calm weather.
- .4 Spread the Topsoil to provide a uniform 100 mm thickness over the entire area as specified in the Contract Documents or as directed by the Owner or Engineer of Record.
- .5 Remove weeds, roots, rocks greater than 25 mm in diameter, debris, and other deleterious materials from the Topsoil.
- .6 Manually spread Topsoil around structures, culverts, fences, instruments, or other obstructions.
- .7 Grade the Topsoil to eliminate uneven areas, and to provide positive drainage.
- .8 Use the track weight of a crawler tractor or dozer to compact Topsoil. A sod roller can be utilized within recently sodded areas.
- .9 Minimize traffic on placed Topsoil to prevent over-compaction. If Topsoil becomes over-compacted, rework to meet specified requirements.
- .10 Topsoil placement is not to be completed around areas of riprap bank stabilization work until which time riprap placement has been completed to avoid disturbing finished surfaces and subsequent rework.

### **3.6 FINISH GRADING (SURFACE PREPARATION) PRIOR TO SEEDING**

- .1 Eliminate rough spots and low areas to ensure positive drainage away from building faces and walkways. Prepare a loose friable topsoil bed by means of cultivation and subsequent raking. Maintain levels, profiles and contours of subgrade.
- .2 Rake and/or harrow the Topsoil surface to produce a loose friable bed to a depth of 50 mm and not less than 25 mm prior to seeding.

- .3 Provide a finished Topsoil surface that is ready for seeding, and that does not require additional preparation of any kind.
- .4 Do not cover catch basins, valve covers or manholes. Cut smooth falls to the catch basin rim, and finish flush. Provide smooth transitions at top and bottom of slopes.
- .5 Float and leave surfaces smooth, uniform, and sufficiently firm against deep foot printing with a fine loose texture. Finish surface shall be clean, even and free from irregular surface changes.
- .6 Grading work shall not be performed when moisture content of soil is such that excessive compaction will occur, or when soil is so dry that clods will not break readily, or dust will form in the air. Apply water as required to prevent the formation of an airborne dust nuisance and to provide ideal soil moisture content for tilling.
- .7 Ditches: Finish ditches and swales to ensure proper flow and drainage. Conduct final rolling operations to produce a hard, uniform and smooth cross-section.
- .8 Sod: Keep topsoil surface 25 mm below finish grade for sodded areas adjacent to walkways, curbs, edging materials, other hard surfaces and crown of adjacent existing turf. Elsewhere, bring topsoil up to grade as indicated on drawings.
- .9 Seeding will not be permitted on hardened, crusted or rutted soil.

### **3.7 SURFACE TRACKING PRIOR TO HYDROSEEDING/BROADCAST SEEDING**

- .1 Surface Tracking is the roughening of the Topsoil moving a tracked tractor or dozer, or other mechanical means acceptable to the Owner, up and down the slope leaving depressions perpendicular to the slope direction, to provide a serrated texture that will reduce erosion potential.
- .2 Perform Surface Tracking in accordance with Alberta Transportations B.M.P. #34 (a-c) of the Field Guide for Erosion and Sediment Control, except as modified herein.
- .3 Perform Surface Tracking prior to Hydroseeding or Broadcast Seeding.
- .4 During Surface Tracking, avoid turning movements or changes in directions that causes loosening or disturbance of the Topsoil. Limit the number of track passes to 1 or 2 times to avoid over compaction.
- .5 Surface Track the following areas:
  - .1 All cut and fill slopes with slopes steeper than 3H:1V with a vertical height greater than 1.5 m.
  - .2 All cut and fill slopes with a slope length greater than 8 m regardless of the actual slope angle.

### **3.8 CLEAN-UP**

- .1 Clean up, immediately, any soil or debris spilled onto roads, walkways, and other finished surfaces. Keep site clean and tidy at all times.
- .2 Dispose of roots, debris, and other deleterious materials at the specified waste disposal area or at an off-Site waste disposal facility.
- .3 Pick and dispose of any rocks greater than 70 mm diameter that appear prior to the date of Substantial Performance of the Work.

**END OF SECTION**