

1. GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 11 00 – Clearing and Grubbing.
- .2 Section 31 23 13 – Subgrade Construction.
- .3 Section 31 32 13 – Cement Stabilized Subgrade Construction.
- .4 Section 32 01 16 – Pavement Milling and Removals.
- .5 Section 32 11 23 – Granular Base.
- .6 Section 33 05 13 – Miscellaneous Removals and Adjustments.

1.2 DEFINITIONS

- .1 Topsoil Stripping:
 - .1 Excavation and stockpiling, or excavation and removal and disposal, of material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping, and will typically include topsoil, peat or other organic material as well as grasses, sod, shrubs, and other vegetative matter.
- .2 Rock Excavation:
 - .1 Excavation of material from solid masses of igneous, sedimentary, or metamorphic rock which, prior to its removal, was integral with its parent mass, or excavation of boulders or rock fragments having an individual volume in excess of one-half cubic metre (0.5m³). Soft or disintegrated rock, concrete or masonry that can be removed with a power operated excavator or shovel, and loose, shaken or previously blasted rock will not be classified as rock excavation.
- .3 Common Excavation:
 - .1 Excavation to specified grades and compaction or excavation, placement and compaction in embankment of all on-site materials of whatever nature, which are not included under the definition of topsoil stripping, rock excavation, waste excavation or borrow excavation, including clay, dense tills, hardpan, frozen materials and partially cemented materials which can be ripped and excavated with heavy construction equipment.
- .4 Waste Material:
 - .1 Material defined as any material determined by the Engineer during excavation operations as material unsuitable for use in the Work or surplus to the requirements of the Work. Such material shall be excavated and removed and disposed of as directed by the Engineer.
- .5 Borrow Material:
 - .1 Excavation, delivery to the Work site, placement and compaction of suitable material obtained off-site and used in embankment.

- .2 Excavation of roadways, roadway ditches and slopes thereof, either inside or outside of the right-of-way, will not be classified as borrow excavation, but rather as common excavation.

- .6 Embankment:
 - .1 Material derived from usable excavation and placed above original ground or in stripped or undercut areas up to subgrade elevation.

- .7 Fill:
 - .1 Any earth structure built up by successive lifts of specified material compacted to specified densities.

- .8 Pavement Structure:
 - .1 A combination of layers of unbound or stabilized granular subbase, granular, asphalt or soil cement base, and asphalt or concrete surfacing.

- .9 Subgrade Elevation:
 - .1 Elevations immediately below the pavement structure.

1.3 BURIED SERVICES

- .1 The Contractor shall be responsible for locating and protecting all existing underground and surface structures, utility pipelines, overhead lines and poles, fences, water and sewer mains, building services, cables, culverts, sidewalks and other works.

- .2 The size, depth and location of the existing utilities and facilities/structures shown on the Plans are for illustrative and guidance purposes only; verification of completeness and accuracy are the responsibility of the Contractor.

- .3 Maintain and protect from damage, all water, sewer, gas, electric, telephone and other utility lines and fixtures and appurtenances that may be encountered. Any pipeline or utility line and their fixtures and appurtenances that may be damaged shall be repaired at the Contractor's entire expense to the satisfaction of the Owner, the Engineer and the Owner of the pipeline or utility.

1.4 COMPLIANCE REQUIREMENTS

- .1 Contractors are required to comply with applicable legislation, regulations, acts, codes, and policies, including, but not limited to the Alberta and Saskatchewan Occupational Health and Safety, Worker's Compensation Board Standards, industry standards, and municipal requirements while completing excavation, embankment, and compaction operations.

- .2 In any case of conflict or discrepancy, the higher standard shall apply.

1.5 OWNERSHIP OF MATERIAL

- .1 Under no circumstances shall any excavated material be sold or otherwise disposed of by the Contractor, Subcontractor, or any of their employees. The excavated Materials remain the property of the Owner unless specified otherwise by the Engineer.

1.6 MEASUREMENT AND PAYMENT

- .1 Topsoil Stripping – Dispose or Stockpile
 - .1 Will be measured in square metres at a specified depth or in cubic metres, as specified in the Bid Forms.
 - .2 The unit price shall include all equipment, labour, supervision, materials, loading, hauling, stockpiling and all other tasks incidental or related to this operation.
- .2 Rock Excavation – Dispose or Stockpile
 - .1 Will be measured in cubic metres calculated from cross-sections taken in the areas of excavation (i.e., in place, compacted volume) carried out by the Engineer.
 - .2 The unit price shall include all equipment, labour, supervision, blasting if required, excavating, scaling of rock and rock fragments, loading, hauling, stockpiling and/or disposal, and all other related or incidental tasks.
- .3 Common Excavation – Dispose or Stockpile
 - .1 Will be measured in cubic metres calculated from cross-sections taken in areas of excavation (e.g., in place, compacted volume) carried out by the Engineer.
 - .2 The unit price shall include all equipment, labour, and supervision necessary for excavating, loading, hauling, disposing or stockpiling the excavated material, and all other related or incidental tasks.
- .4 Common Excavation – Embankment
 - .1 Will be measured in cubic metres based on the volume calculated from cross-sections taken of the compacted in place fill.
 - .2 The unit price shall include all equipment, labour, and supervision necessary for excavating, loading, hauling, placement, compaction, moisture adjustments, and all other related or incidental tasks.
 - .3 Material excavated from one part of the project and utilized in another part of the same project shall be paid as Common Excavation - Embankment.
- .5 Borrow Material
 - .1 Will be measured in cubic metres based on the volume of compacted in place fill or un-compacted in place fill as designated within the Bid Forms.
 - .2 The unit price for borrow material shall include all costs related to clearing and grubbing and removal of topsoil and overburden of the borrow site and excavating, loading, hauling, placement, and compaction of the borrow material.
- .6 Over Excavation – Dispose.
 - .1 Will be measured in cubic metres of in-place compacted material, measured from cross sections taken in areas of excavation, carried out by the Engineer. In the event that the over-excavated material cannot be accurately measured by the Engineer through survey or other means, payment based upon the cubic metre of hauled material, divided by a factor of 1.30, will be made.
 - .2 The unit price shall include all equipment, labour, and supervision necessary for excavating, loading, hauling, disposing or stockpiling the excavated material, and all other related or incidental tasks.
- .7 There shall be no payment to the Contractor for drying or adding water to the material for compaction purposes.

.8 There shall be no payment to the Contractor for proof-rolling.

2. PRODUCTS

2.1 MATERIALS

- .1 The Engineer will determine the suitability of excavated materials for use in any embankment, subgrade backfill, berm, and any other purpose.
- .2 Material used for embankments is not to contain organic matter, frozen lumps, weeds, sod, roots, logs, stumps, or any other objectionable matter. Remove and deposit as directed by the Engineer.
- .3 When directed by the Engineer, reserve and stockpile at designated locations topsoil, sand, gravel, surplus fill, and other materials deemed salvageable by the Engineer.
- .4 Borrow
 - .1 Location and acquisition of granular, sand, and clay borrow material shall be the responsibility of the Contractor, including related royalties, right-of-way, and construction and maintenance of access roads, bridges, and ditches.
 - .2 Obtain borrow material from sources approved by the Engineer.
 - .3 If the borrow material is to be provided by the Owner, the Contractor shall be responsible for the construction and maintenance of access roads, bridges, and ditches as well as rehabilitating the borrow source to the satisfaction of the Engineer and the Owner, including but not limited to smoothing out transitions, removing access roads, bridges and ditches, and promoting positive drainage of the borrow source.
- .5 Remove and dispose of materials deemed surplus by the Engineer.

3. SITE PREPARATION

- 3.1 Do site preparation work as shown on the Plans and Drawings or as directed by the Engineer in accordance with the Site Preparation Section.
- 3.2 The Contractor shall advise the Engineer sufficiently in advance of commencing any type of excavation operations so that initial cross-section measurements can be taken.
- 3.3 Prior to commencing any Work, the Contractor shall locate and mark, or have located and marked, the presence of all pipelines, utility lines, and associated fixtures or appurtenances within or adjacent to the area of the Work.
- 3.4 Prior to commencing any Work, the Contractor shall supply, install or erect, and maintain traffic control devices such as signs, barriers, barricades, fences, etc. and, if required, provide flag persons to safely guide, direct and control traffic through and around any areas affected by the Work, in accordance with the approved Traffic Accommodation Strategy.
- 3.5 The Contractor shall take all necessary precautions to preserve all survey monuments and property pins or markers along, adjacent, or within the areas of grading or excavation. Any costs related to the restoration of monuments, pins, or markers that are disturbed or destroyed shall be the sole responsibility of the Contractor.

4. EXECUTION

4.1 EQUIPMENT

- .1 Only vehicles licensed for highway use shall be used for hauling on developed roadways.
- .2 Compaction equipment must be capable of obtaining required densities in materials used in the Work.
- .3 Water distributors must be capable of distributing water uniformly.

4.2 TOPSOIL STRIPPING

- .1 Strip or excavate, salvage and stockpile the topsoil, subsoil, and other organic overburden to the extent shown in the Plans and Drawings, or as directed by the Engineer. Avoid contamination of the topsoil, subsoil and other organic overburden with underlying soil material.
- .2 Stockpile the materials in a manner which prevents contamination of one material with another. Maintain a minimum distance of one (1) metre between stockpiles of different materials.
- .3 Place stockpiles where they will not interfere with other construction activity, will not be subject to erosion, and where positive drainage away from the stockpiles can be maintained.

4.3 EXCAVATING

- .1 General:
 - .1 Advise the Engineer sufficiently in advance of excavation operations for initial cross section measurements to be taken.
 - .2 Where necessary, perform clearing and grubbing according to Section 31 11 00 – Clearing and Grubbing, and remove designated pavement and concrete according to Section - 33 05 13 Miscellaneous Removals and Adjustments and Section 32 01 16 – Pavement Milling and Removals.
 - .3 Maintain crowns and cross slopes to provide good surface drainage.
 - .4 Excavate to designated cross-sections. Complete initial excavation from property line to property line, unless permitted or directed otherwise by the Engineer. Exercise caution to preserve bank stability where necessary. Stage excavation to allow related work.
 - .5 Where sub-grade is in transition from excavation to embankment, treat ground slopes at the transition points to ensure a cohesive material is present at the transitions as directed by the Engineer.
 - .6 Dispose of waste/surplus material at locations directed by the Engineer.
- .2 Unsuitable Materials:
 - .1 Notify the Engineer whenever unsuitable materials are encountered in cut sections. Remove materials unsuitable for embankments to the lateral limits and depths directed.
 - .2 Unsuitable materials are to be hauled to an approved disposal site.

- .3 Use of Excavated Soil:
 - .1 Use Engineer approved excavated soil to construct embankments, subgrade, berms, boulevard fill, trench backfill, and for other purposes as directed. No additional payment will be allowed for imported soil when there exists sufficient approved material from the excavation.

- .4 Borrow:
 - .1 Completely use in embankments suitable materials removed from Common Excavations before taking material from borrow areas.
 - .2 Where the excavated suitable material is not sufficient for job site use, obtain additional material from a designated borrow site. Excavate, load, haul, and place where required.
 - .3 The pit area shall be cleared, stripped and worked in a manner satisfactory to the Engineer. The excavation shall be carried out in such a way as to avoid ponding of water in the excavation. All trees and brush shall be cleared in accordance with Section 31 11 00 – Clearing and Grubbing.
 - .4 The borrow pit shall be shaped to a 4:1 slope. The pit shall be left in a neat and tidy condition satisfactory to the Engineer and/or the owner on whose land the pit is located.

- .5 Side Ditches:
 - .1 Construct side ditches to the depths and widths indicated or directed by the Engineer, to permit the ready flow of surface water.
 - .2 Maintain and keep ditches open and free from debris until final acceptance of the Work.

- .6 Undercut:
 - .1 When excavation exposes unsuitable materials below the subgrade elevation and the Engineer directs removal, excavate such materials using transition slopes not steeper than 10% along the road profile. Make the bottom of the cut level, with no loose material.

- .7 Over Excavation:
 - .1 Where over-excavation occurs, restore grades by backfilling, compacting, and regrading as directed by the Engineer. If over-excavation results from the Contractor's error, the Owner will not pay for the excess excavation and grade restoration.

4.4 EMBANKMENTS

- .1 Where indicated or directed by the Engineer, scarify or bench existing slopes in the side of hills, or sloping sections to ensure a proper bond between new materials and existing surfaces. Obtain prior approval of the method to be used.

- .2 Do not place material that is frozen nor place material on a frozen surface.

- .3 Maintain a crowned surface during construction to ensure the ready run-off of surface water.

- .4 With material containing less than 10% by volume of stone or rock fragments larger than 100mm:

- .1 Place and compact to the full width in uniform layers not exceeding 150mm thick when compacted. The Engineer may authorize thicker lifts if the specified compaction can be achieved.
- .2 Compact to a density of not less than 98% Standard Proctor Density, except the last 300 mm up to subgrade elevation. Compact the last 300 mm to 100% Standard Proctor Density (ASTM D698). The material in each layer shall be compacted at the optimum moisture content plus or minus 2%, unless otherwise required by the Engineer.

4.5 MAINTENANCE

- .1 Do not permit vehicular traffic over the prepared subgrade.
- .2 If the subgrade floods, drain immediately by natural flow or by pumping to catch basins, manholes, or ditches.
- .3 Maintain finished surfaces in a condition conforming to this section until acceptance.
- .4 The Contractor shall, at its own expense, repair any damages to a prepared subgrade surface as well as repair damages done to culverts by its equipment, and shall remove any obstructions it may have placed which will interfere with the normal function of a drainage system.
- .5 The Contractor shall, at all times and at its entire cost, be responsible for protecting the Work site against the entry of surface water into the Work area, including, as may be required, the pumping and removal of such surface water with the discharge of such surface water to a location and in a manner acceptable to the Engineer.

END OF SECTION