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E1. DESCRIPTION

This section specifies the requirements for placing topsoil, seeding, sodding, watering, fertilizing and cutting vegetation on all reserves, PUL's, Stormwater Management Facilities and road rights-of-way areas.

E2. Material

The work shall include the placing of top soil, seeding, watering and at least two successive cuttings of all grassed areas indicated on the plans or as called for under the contract documents.

E2.1 Roadway Grassing

All materials used in these specifications are subject to inspection testing and approval by the County.

1. Topsoil

- a) Shall be of a natural, fertile agricultural soil of the "A" horizon layer capable of sustaining vigorous plant growth. It shall be best quality, free of subsoil, clay lumps, stones, live plants and their roots, sticks or other extraneous matter. Topsoil shall be placed as per Section C14.2 (2).
- b) The County may request a sample and an independent laboratory analysis of topsoil from each source to be used in the performance of this contract seven (7) calendar days in advance of delivery to the site. The laboratory analysis shall include tests for N, P, K, minor element values, soluble salt content, electrical conductivity, pH and physical values (sand, clay and organic material). If necessary, correct additions, e.g. bone meal, limestone, pesticides, phosphates, and sulfates shall be added as approved by the County.
- c) The chemical specifications for topsoil are that it shall:
 - contain no toxic materials
 - have an electrical conductivity of 3 – 4 ohms/cm²
 - have a pH of 6.0 – 7.5

2. Seed Mixture

The seed mixture shall be:

Creeping Red Fescue	70% by weight
Meadow Brome	10% by weight
Western Wheatgrass	10% by weight
Annual Ryegrass	10% by weight

The mixture shall comply with Federal and Provincial seed laws and have a minimum germination of 75% and a minimum purity of 97%. Bags of seed mixture shall be clearly tagged, showing the name of the supplier and the contents. All seed must have an accompanying Certificate of Compliance

3. **Sod** – Sod shall be No. 1 nursery-grown sod, consisting of a uniform mixture of:

Kentucky Blue Grass	60% by weight
Creeping Red Fescue	40% by weight

Sod shall be cut by approved methods in accordance with the recommendations of the Nursery Sod Growers Association of Alberta and shall be:

- a) a minimum of eighteen months old
 - b) of a quality that satisfies weed tolerance rates as outlined by the Growers Assoc.
 - c) 20 – 25mm in thickness
 - d) cut in strips of uniform width
 - e) sufficiently moist so that no burning of the edges has occurred
 - f) shall have a thick healthy growth
 - g) wooden pegs where required per section E3.5(2) shall be minimum 250mm length and approximately 25mm x 25mm square, or approved equal.
4. **Fertilizer** – Fertilizer shall conform to the following:
- a) Root Fertilizer:
 - Granular water soluble fertilizer 10-6-4 super phosphate
 - Granular water soluble fertilizer 5-20-10 or equivalent
 - b) Supplementary Fertilizer:
 - Organic fertilizer 14-7-6
 - Even 35%
5. **Peat Moss** – Peat moss shall be mixed with topsoil and meet the following specifications:
- a) Have a pH value of 5.0 – 7.0

- b) Have a water holding capacity of 1100% by weight
- c) Be free of toxic material, live plants, live roots or seeds
- d) Be delivered in a pulverized condition

E2.2 Reserve and PUL Grassing

All materials used in these specifications are subject to inspection testing and approval by the County.

1. Topsoil

- a) Shall be of a natural, fertile agricultural soil of the “A” horizon layer capable of sustaining vigorous plant growth. It shall be best quality, free of subsoil, clay lumps, stones, live plants and their roots, sticks or other extraneous matter. Topsoil shall be placed as per Section C14.2 (2).
- b) The County may request a sample and an independent laboratory analysis of topsoil from each source to be used in the performance of this contract seven (7) calendar days in advance of delivery to the site. The laboratory analysis shall include tests for N, P, K, minor element values, soluble salt content, electrical conductivity, pH and physical values (sand, clay and organic material). If necessary, correct additions, e.g. bone meal, limestone, pesticides, phosphates, and sulfates shall be added as approved by the County.
- c) The chemical specifications for topsoil are that it shall:
 - contain no toxic materials
 - have an electrical conductivity of 3 – 4 ohms/cm²
 - have a pH of 6.0 – 7.5

2. Seed Mixture

The seed mixture shall be:

Creeping Red Fescue	40%
Kentucky Blue Grass	30%
Crested Wheat Grass	15%
Timothy	15%

The mixture shall comply with Federal and Provincial seed laws and have a minimum germination of 75% and a minimum purity of 97%. Bags of seed mixture shall be clearly tagged, showing the name of the supplier and the contents. All seed must have an accompanying Certificate of Compliance

3. **Sod** – Sod shall be No. 1 nursery-grown sod, consisting of a uniform mixture of:

Kentucky Blue Grass	60% by weight
Creeping Red Fescue	40% by weight

Sod shall be cut by approved methods in accordance with the recommendations of the Nursery Sod Growers Association of Alberta and shall be:

- a) a minimum of eighteen months old
 - b) of a quality that satisfies weed tolerance rates as outlined by the Growers Assoc.
 - c) 20 – 25mm in thickness
 - d) cut in strips of uniform width
 - e) sufficiently moist so that no burning of the edges has occurred
 - f) shall have a thick healthy growth
4. **Fertilizers**
- a) Fertilizer shall be packed in standard containers, clearly marked with the name of the manufacturer, mass and analysis.
 - b) All fertilizer shall be stored in a weatherproof storage place and in such a manner that it will stay dry and its effectiveness is not impaired.
 - c) Root starter:
 - granular water soluble fertilizer 10-6-4 or 20-20-20
 - organic fertilizer 11-48-0
 - ureaform or slow release ammonium nitrate if available

5. **Peat Moss**

If organic material is required to meet the organic material specifications for topsoil, peat moss shall be added in the field and thoroughly mixed with cultivation equipment. The peat moss shall meet the following specifications:

- a) free of toxic material, live plants, live roots, seeds or other deleterious material
- b) delivered in a pulverized condition
- c) approved prior to mixing with topsoil
- d) of a pH not less than 4.5 and not greater than 6.0

E2.3 Trees and Shrubs

1. **Species** –all species used in landscaping plan must be native to the local area, capable of healthy growth in Lacombe County and be resilient to specific site location factors present (i.e. Sun, excessive wind, shade, gravel and reasonable maintenance practices).

On the advice of a qualified landscape architect or arborist only, species may be altered to suit unique site topography, soils or micro-climatic conditions. For a list of approved tree and shrub species please refer to Lacombe County’s *Guide to Suitable Landscaping Species*.

2. **Stock** –shall be healthy (free from damage, disease and pests, eggs or larvae), well branched, densely foliated when in leaf with well-developed root systems and of the specified caliper and height. All undersized root systems will be rejected.

3. **Size specifications:**

Deciduous Trees	50mm caliper at trunk
Coniferous Trees	2.0m in height

4. **Substitutes** – substitutes will not be permitted unless approved in writing by the County.
5. **Bare Root Shrubs** – bare root shrubs shall be planted with adequate fibrous roots retained. The minimum size of root balls for trees shall be as specified below:

a) **Deciduous Trees**

Caliper (mm)	Root Ball Diameter (mm)	Machine Ball Diameter (mm)
25	600	
50	750	1,100
75	900	1,400
100	1,100	1,700
125	1,400	1,700
150	1,400	2,300
200	1,800	2,300
250	2,300	2,300

Note: Deciduous trees larger than 75mm caliper shall be moved by machine (tree spade).

b) **Coniferous Trees**

Height (m)	Root Ball Diameter (mm)	Machine Ball Diameter (mm)
1.50 – 1.75	750	1,100
1.75 – 2.00	900	1,100
2.00 – 2.25	1,100	1,400
2.25 – 2.50	1,200	1,400
2.50 – 2.75	1,400	1,700

6. **Ball and Burlapped Plants** –plants shall be dug with firm natural balls of earth to sufficiently include most of the fibrous roots.
7. **Container Growth Stock** –stock shall be grown in a container long enough for the root system to have developed sufficiently to hold its soil together. No plants shall be loose in the container.
8. **Fertilizers** –shall be 8-24-24 delivered as specified in standard size, unopened containers, showing the weight, analysis and manufacturer’s name.
9. **Tree stakes and Ties**
 - a) Stakes shall be 2.0 – 2.5m in length and of steel “T” bar or “U” bar type.
 - b) Tree ties shall be a number ten (10) gauge galvanized wire inserted into a 200mm length of 10mm diameter polyurethane plastic tubing. Wire for tree tying shall be a double strand number nine (9) gauge galvanized wire.
10. **Mulch** –mulching material shall be wood cellulose or approved equal, clean, dry and free of weeds and other foreign matter.
11. **Storage** –All materials shall be stored in a weatherproof place and handled in a professional manner.

E2.4 Stormwater Management Facility Planting

Stormwater Management Facilities are to be planted in accordance with Lacombe County’s *Standards for Stormwater Management Facilities*, federal and provincial legislation and policies.

Landscaping for Stormwater Management Facilities will generally include mass plantings and naturalized shorelines mimicking natural wetlands typical of the Lacombe County Region, live topsoil’s to be used whenever possible

E3. CONSTRUCTION

E3.1 Weed Control

The Contractor shall be responsible for the control of existing weeds and all subsequent weed growth within the contract site(s) as shown on the approved plans, or in the list of locations from the date the contract is awarded or the date that the location is made available until the completion certificate has been issued. The “Alberta Weed Control Act” shall govern.

E3.2 Subsoil Preparation

All weeds, roots, stones larger than 50mm in diameter and other foreign matter shall be removed from the surface of the subsoil. Immediately before placing topsoil, the subsoil shall be loosened to a depth of not less than 50mm by means of a disc, spike tooth harrow or other means satisfactory to the County and leveled to a firm, even surface. The final grade shall be 150mm (or as specified) below the adjacent top of curb and/or sub-grade and sloped so that no ponding or runoff onto adjacent private property occurs.

E3.3 Topsoil Placement and Cultivation

1. **Placing** – the topsoil shall be uniformly spread on the prepared subsoil to a minimum compacted depth of 150mm (or as approved otherwise). Topsoil shall not be placed when either the topsoil or subsoil is frozen, excessively wet, extremely dry or otherwise in a condition detrimental to proper grading, compaction or cultivation. The upper 50mm shall be of a fine texture and free of stones or lumps 6mm or larger. Allowances for settlement shall be provided where necessary.

If required, lime shall be well worked into the soil before the application of any fertilizers to obtain a minimum pH value of 6.0.

2. **Cultivation** – after topsoil placement the area shall be thoroughly disked, harrowed and floated to a minimum depth of 75mm. All hard lumps shall be broken down and all stones larger than 50mm in diameter, roots, stumps and other foreign matter shall be removed and disposed of in a manner approved by the County.

3. **Fertilizing** – After the topsoil has been properly prepared, a uniform application of fertilizer, per Section E2, shall be placed at the rate of 250 kg/ha using a mechanical spreader. The fertilizer shall be thoroughly and evenly mixed with the soil to a maximum depth of 75 mm. Approximately six (6) weeks after germination, supplementary application of fertilizer, per Section E2, shall be applied at a rate of 250kg/ha.

4. **Compaction** – topsoil shall be compacted to 80 – 85% Standard Proctor density.

E3.4 Seeding

1. Grass seeding will be required on all roadway ditch bottoms, side-slopes, back-slopes and open areas disturbed during construction of County or subdivision roads, reserves, PUL's or Stormwater Management Facilities. Areas which do not have acceptable grass coverage or are weed infested will also require seeding.
2. Seeding shall not be carried out when wind velocities are above 8km/h.
3. Application
 - a) The recommended rate of application of seed is 250kg/ha by mechanical applicator. An application of 112kg/ha of starter fertilizer is recommended at the time of seeding.
 - b) Hand application with a cyclone type seeder capable of distributing seed in two directions in equal amounts. Hand application shall require a 6 mm topdressing of mulch of pulverized peat moss.
 - c) Mechanical application with a calibrated grass seeder complete with compaction roller.
 - d) Hydro-seeding by applying an approved turf-fiber at a rate of 0.135 kg of dry matter/m².
4. Seeding will be approved when there is a consistent cover of newly germinated grass on all areas seeded.
5. To avoid washing, the area shall receive light watering with a fine spray to a penetration of not less than 25 mm, after the seed operations are completed. In areas where seed fails to germinate for whatever reason, the Contractor shall re-cultivate and re-seed until germination occurs.
6. Approximately six (6) weeks after germination, the area shall receive a supplementary application of an organic fertilizer at rates determined by soil tests.

Note: Any seed which fails to germinate for whatever reasons shall be re-cultivated and re-seeded until germination has taken place at the Developer's expense.

E3.5 Sodding

Sodding is required on slopes that are 2:1 or steeper, or where specified by the County.

1. **Subsoil Preparation** – on slopes less than 2:1, the subsoil shall be prepared as specified in Section E3.2.
2. **Sod Laying** – sod shall be laid evenly with staggered joints closely butted together and matched to the existing grades or surrounding areas. All areas shall be rolled with a medium roller (90 – 114 kg) to provide close contact between sod and topsoil and to produce a smooth and even surface. Sod shall be laid at right angles to the slope along the contours of the slope. On slopes of 2:1 or steeper, wooden pegs shall be driven full depth on intervals of 1m.
3. **Watering** – the sod shall be watered sufficiently to saturate the upper 75mm of soil immediately after installation. After sod and soil has dried sufficiently to prevent damage, the area shall be again rolled with a medium roller to ensure a good bond between sod and soil and to remove minor depressions and irregularities. Adequate watering shall again be applied immediately following rolling to saturate the upper 75mm of soil. Watering shall be carried out when required to prevent grass and underlying soil from drying out for a minimum period of fifteen (15) days after placement or until the sod is well rooted and established.
4. **Supplementary Fertilizer Application** – approximately four (4) weeks after sod laying and after the initial cutting, the sodded area shall receive an application of organic fertilizer, rates determined by soil tests.
5. **Workmanship** – the finished turf shall be smooth and even and there shall be no sudden irregularities in the final grade.

E3.6 Tree and Shrub Planting

1. **Layout** – the layout of trees and shrub planting shall be identified in the landscape plan as approved by the County.
2. **Water** – water shall be free of any impurities which would inhibit germination or otherwise adversely affect growth.
3. **Lime** – lime is to be used where the pH of the soil is less than 6.0 and shall be ground limestone containing not less than 80% of total carbonates combined. It shall be ground to such fineness that at least 50% will pass a 100-mesh sieve and at least 90% will pass a 20-mesh sieve. Where limestone is specified, it shall be stored in such a manner as to stay dry and free-flowing.

E3.7 Growing Season

1. **Grass Planting** – grass seed shall not be planted before May 1st or after September 15th.

2. **Sod Laying** – sod shall not be laid before May 1st or after September 30th. Sod laying on slopes 3:1 or steeper shall not be done when the temperature is above 23° C.
3. **Tree Planting** – Within one (1) year after the issuance of a Construction Completion Certification for paved roads, the Developer shall sod and plant boulevard trees on all roads as approved by the County. Deciduous trees should be placed in a uniform lineal manner. The Developer shall be responsible for full maintenance and tree replacement for one (1) calendar year after installation.

E4 Maintenance

Maintenance shall commence immediately after sodding or seeding and shall continue until the date of acceptance by the County. Such maintenance shall include all measures necessary to establish and maintain grass in a vigorous growing condition, including but not limited to:

1. **Mowing** – mowing shall be done as required to maintain the grass at a maximum height of 75mm, with not more than 1/3 of the blade cut at any one mowing. Heavy clippings shall be removed immediately after mowing.
2. **Top Dressing** – top dressing and rolling shall be done as required to repair ruts or erosion. Bare spots shall be repaired by either cultivation or re-seeding or by replacing the dead sod with new sod as required by this specification.
3. **Cleanup** – Cleanup shall be a continuous operation and at no time shall topsoil or debris of any kind be allowed to remain on roadways overnight.