

PART E

SPECIFICATIONS

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

- E1.1 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.1.1 *The City of Winnipeg Standard Construction Specifications* is available in Adobe Acrobat (.pdf) format on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.
- E1.1.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.1.3 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.2 The following Drawings are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing</u>
G.041-A	Gordon Bell High School Café - Layout and Materials Plan
G.041-B	Gordon Bell High School Café – Planting Plan
G.041-C	Gordon Bell High School Café – Details Sheet

E2. EXCAVATION AND REMOVALS

E2.1 Description

- (1) This specification shall amend and supplement City of Winnipeg Standard Construction Specifications CW 3110-R7. The work to be done by the Contractor under this specification shall include all labour, equipment and material necessary for and incidental to the satisfactory performance and completion of the Work herein specified.

E2.1.1 Materials

- (1) Excavation and removals includes the removal of items (i.e. fence) as indicated on the Drawings as directed by the Contract Administrator. Work includes the stockpiling of suitable Site material, and the satisfactory disposal of unsuitable Site material such as clays susceptible to frost-heaving, silts, rock rubble rubbish and any surplus suitable Site material. Do not disturb adjacent items designated to remain in place.

E2.1.2 Construction Methods

- (1) Disposal of material shall be understood to mean the hauling of all unsuitable material from the Site and the unloading in a legal manner acceptable to the Contract Administrator. If arrangements are made in advance excavated material may be disposed of on Site at a location designated by the Contract Administrator.

E2.1.3 Method of Measurement and Basis of Payment

- (1) Excavation and removals shall be considered incidental to and payment to be included with the prices for earthwork and grading, asphalt paving and planter / tree pit preparation. No payment will be made for material removed outside the limits of excavation.

E.3 EARTHWORK AND ROUGH GRADING

E.3.1 Description

This Specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3170-R3. The Work to be done by the Contractor under this Specification shall cover all phases of grading and placement fill material.

E.3.1.1 Materials

- (1) Native Fill Material: Clay fill material shall consist of low to medium plastic clays or mixtures of sand and clay, uniform in texture and suitable for compaction. This material shall be free of contamination by foreign substances.

E.3.1.2 Construction Methods

- (1)
 - .1 Rough site grading shall be completed within the limits indicated and to the design elevations, gradients and dimensions shown on the construction drawings or as directed by the Contract Administrator. The rough grading shall be within 30 mm of the specified elevations with allowance made for the specified depth of topsoil and sod, or other specified surface treatment.
 - .2 The gradient for all areas shall be considered to be straight grade between the design elevations shown.
 - .3 Elevations shown on the construction drawings are the finished grade (i.e.: top of sod).
- (2) Fill Material
 - (i) Where fill is required to meet rough grade elevations, fill material shall be placed in the designated locations in lifts not exceeding 200 mm and compacted to a minimum of 95% Standard Proctor Density. The material shall be compacted at the optimum moisture content, or as directed by the Contract Administrator.
- (3) Any material dropped or spilled on any streets during the delivery or disposal operations shall be promptly cleaned up by and at the expense of the Contractor, to the satisfaction of the Contract Administrator.
- (4) Correction of Damage
 - (i) Restore any area damaged as a result of the Contractor's operations in connection with this project to its original condition or better. Such restoration shall be at the expense of the Contractor and to the satisfaction of the Contract Administrator.

E.3.1.3 Quality Control

- (1) Inspection
 - .1 All Workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works, which are not in accordance with the requirements of this Specification.
- (2) Access

The Contract Administrator shall be afforded full access for the inspection and testing of materials, both at the Site of Work and at any plant or borrow pit used for the supply of the materials, to determine whether the material is being supplied in accordance with this Specification.

(3) **Materials**

All materials supplied under this Specification shall be subject to testing and approval by the Contract Administrator in accordance with the requirements of this Specification.

(4) **Quality of Construction**

The Standard Proctor Density for the fill materials shall be determined at the optimum moisture content in accordance with ASTM Standard D698. The field density of each layer shall be a percentage of the applicable Proctor Density, as specified in this Specification.

Quality control tests will be used to determine the acceptability of each layer placed and compacted by the Contractor, before the succeeding layer may be applied.

The field density of the compacted layers shall be verified by Field Density Tests in accordance with ASTM Standard D1556, Test for Density of Soil in Place by the Sand-Cone Method, or ASTM Standard D2922, Test for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

The frequency and number of tests to be made shall be as determined by the Contract Administrator.

Holes made by the removal of samples from the layers shall be promptly filled by the Contractor with appropriate material and thoroughly compacted so as to conform in every way with the adjoining compacted material.

(5) **Cold Weather Requirements**

Backfill shall be placed in a dry, thawed condition and shall be maintained free of moisture or frost.

(6) **Corrective Action**

The Contractor shall, at his own expense, correct such Work or replace such materials found to be defective under this Specification in an approved manner to the satisfaction of the Contract Administrator.

E.3.1.4 Method of Measurement and Basis of Payment

- (1) Rough grading will be measured and paid for at the Contract unit price for "Earthwork and Rough Grading", measured on an area basis. The area to be paid for shall be the total area in square metres graded in accordance with the construction drawings and this Specification, as computed from measurements made by the Contract Administrator. Measurements for native fill material and for excavation will be considered incidental to the process of grading.
- (2) Payment shall be compensation in full for supplying all labour, equipment, materials and performing all operations associated with excavation and supplying and placing the fill materials to the lines and grades specified.

E.4 GRAVEL PAD

E.4.1 Description

- (1) This Specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3110-R7 and drawing SCD-624A. The Work to be done by the Contractor under this Specification shall cover all phases of sub-grade and base preparation as well as the placement of the surface material.

E.4.1.1 Materials

- (1) Products:
 - (a) Base course material shall consist of sound, hard, crushed rock or crushed gravel and shall be free from organic or soft material which would disintegrate through decay or weathering.
 - (b) Finish material shall be ¼" Down Crushed Limestone.

E.4.1.2 Construction Methods

- (1) The bottom of the excavation shall be inspected and approved by the Contract Administrator before the Contractor may begin compaction of the sub-grade.
- (2) In areas of suitable sub-grade material, the full width of the bottom of the excavation shall be thoroughly mixed and compacted to a minimum of ninety-five percent of Standard Proctor Density.
- (3) In areas where unsuitable sub-grade material must be bridged, a layer of crushed sub-base material of not less than 300 mm in compacted thickness, or greater thickness as directed by the Contract Administrator, shall be placed immediately over the unsuitable sub-grade material and compacted to a minimum or ninety percent of the Standard Proctor Density.
- (4) The compacted sub-grade or final compacted layer of sub-base material shall be trimmed to the elevation of the bottom of the base course as shown on the drawings, to the satisfaction of the Contract Administrator.
- (5) The compaction requirement specified herein shall extend to a minimum depth or 150 mm below the surface being compacted. If necessary, water sprinkling shall be carried out in such a manner as to provide a uniform soil wetting distribution over the area to be compacted.
- (6) Any layer which has been rejected by the Contract Administrator shall be either re-compact or removed and replaced by and at the expense of the Contractor to the satisfaction of the Contract Administrator.
- (7) Base course material shall be well graded throughout and shall conform to the grading requirements as specified in CW 3110-R7.

E.4.1.3 Method of Measurement and Basis of Payment

- (1) Sub-grade compaction will be measured on an area basis. The area to be paid for shall be the total number of square metres that are compacted in accordance with this Specification acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.
- (2) The supplying, placing and compaction of crushed gravel base course material and crushed limestone finish material will be measured on an area basis and will be paid for at the Contract Unit Price per square metre for "Supplying and Placing Crushed Gravel Base Course Material and Crushed Limestone Finish Material", measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the work included in this Specification.

E. 5. ASPHALTIC CONCRETE PAVEMENT

E.5.1 Description

- (1) This Specification shall cover the preparation of hot-mixed, hot-laid, asphaltic concrete paving mix for, and all placing operations relating to, the construction of an asphaltic pavement. This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3410-R7.
- (2) The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as Hereinafter specified.

E.5.1.1 Materials

- (1) Products:
 - (a) Fine Aggregate: Clean, hard sand free from deleterious substances.
 - (b) Coarse Aggregate: Natural gravel or crushed stone, clean, hard and free from deleterious matter.
 - (c) Asphalt Cement Pavement Type 1A
- (2) Incidental Products:
 - (a) Prime Coat shall consist of either emulsified or cutback asphalt. Selection shall be based upon existing field conditions and shall be subject to the approval of the Contract Administrator. Method of application shall conform to manufacturer's recommendations.

E.5.1.2 Construction Methods

- (1) The placing of the asphaltic concrete paving mixture shall not commence until the construction of the sub-grade, sub-base and base course has been completed in accordance with the requirements of Specification CW 3110-R7.
- (2) The Contract Administrator shall approve the surface upon which new asphaltic concrete paving mix is to be placed before the paving operations for that course may begin.
- (3) The first course shall be laid upon a surface which is dry, clean and free from standing water, and only when weather conditions are suitable.
- (4) In the case of placing new asphaltic concrete pavement, the base course shall have been previously prepared with one uniform application of Prime Coat prior to the delivery of the asphaltic concrete paving mixture.
- (5) No paving course shall be started until any frost or moisture from previous inclement weather has evaporated to leave a dry surface.
- (6) The mixture shall be delivered to the job and placed at a temperature optimum for proper compaction.
- (7) Unless otherwise permitted by the Contract Administrator, the mixture shall be spread by means of a mechanical self-powered paver capable of spreading the mixture true to the line, grade and crown required.
- (8) Where the thickness of the mixture exceeds 75 mm, the mixture shall be placed in two layers. The levelling course, shall be placed such that the final layer or surface course is of uniform thickness and of minimum thickness of 40mm.
- (9) Rolling shall occur until all roller marks are eliminated and no further compression is possible, as specified in CW 3410 – R7.
- (10) Along posts and all other places not accessible to the roller, thorough compaction must be secured by means of hot tampers.

E.5.1.3 Method of Measurement and Basis of Payment

- (1) The supply and installation of the asphaltic concrete pavement will be measured on an area basis and will be paid for at the Contract Unit Price per square metre for the "Supply and Installation of Asphaltic Concrete Pavement". The area paid for will be the total

number of square metres of asphalt laid in acceptance with this specification, accepted and measured by the Contract Administrator.

E.6. SODDING

E.6.1 Description

- (1) This Specification shall amend and supplement City of Winnipeg Standard Specification CW 3510-R7, Sodding, and shall provide for the supply and installation of nursery sod.

E.6.1.1 Materials and Methods

- (1) Sod shall be City of Winnipeg approved sod for general park areas grown on a mineral soil base.
- (2) The Contractor may be required to provide sod test results for a testing laboratory acceptable to the Contract Administrator indicating that the sod used has a minimum 70% non-organic soil by volume. Cost of said testing shall be borne by the Contractor.
- (3) The Contractor shall provide detailed information on the seed mixes used in cultivation of sod.
- (4) Sod shall be installed only to the limits identified on the Drawings (Note that the limit of sod is less than the limit of construction).

E.6.1.2 Method of Measurement and Basis of Payment

- (1) Sodding will be measured on an area basis. The area to be paid for shall be the total number of square metres 1) sodded and 2) maintained in accordance with this Specification and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator
- (2) Sodding will be paid for at the Contract unit price per square metre for each item of Work listed below, measured as specified herein, which price shall be payment in full for supplying all labour, equipment and materials and completing all operations (for each item of Work) herein described, and all other items incidental to the Work included in this Specification.

E.7 SEGMENTAL RETAINING WALL PLANTERS

E.7.1 General Description

- (1) The following list generally describes the scope of this Section:
 1. Excavation and foundation soil preparation.
 2. Supply and installation of granular base.
 3. Supply and installation of granular backfill.
 4. Supply and installation of geotextile filter.
 5. Supply and installation of segmental retaining wall facing units - Barkman Concrete Pisa II.
- (2) The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as Hereinafter specified.

E.7.1.1 Materials

- (1) Definitions

- .1 Modular concrete retaining wall units are dry-cast solid concrete units that form the external facia of a modular unit retaining wall system.
- .2 Coping units are the last course of concrete units used to finish the top of the wall.

(2) Products

a. Concrete Segmental Retaining Wall Units:

- i. The concrete wall modules shall be Barkman Concrete Pisa II as shown on the Construction Drawings and as follows:

1. Pisa II Standard Unit 12" D x 6" H x 8" W ('Natural' colour)
2. Pisa II Corner Unit 12" D x 6" H x 9" W ('Natural' colour)
3. Revers-A-Cap Coping Unit 12" D x 3" H x 8" W ('Natural' colour)

b. Foundation Soil:

- i. The foundation soil shall be the native undisturbed on site soil.

c. Granular Base:

- i. The footing shall be non-frost susceptible, compacted granular base course material, $\frac{3}{4}$ " down, in accordance with requirements of base course material specified in CW 3110-R7.

d. Granular Backfill:

- i. The backfill material shall be a free draining angular granular material of uniform particle size smaller than 25 mm (1 in.) separated from the retained soil by a geotextile filter.

e. Geotextile Filter:

- i. Filter cloth shall be Pro Pex 4530 polypropylene non-woven needle punched fabric.

f. Concrete Adhesive:

- i. The adhesive is used to permanently secure the coping stone to the top course of the wall. The adhesive must provide sufficient strength and remain flexible.

E.7.1.2 Source

- (1) Barkman Concrete Pisa II Retaining Wall, sizes and finish as stated above.

Barkman Concrete
909 Gateway Road
Winnipeg, MB
R3K 3L1
Ph: (204) 667-3310
Fax: (204) 663-4854

E.7.1.3 Construction Methods

- (1) Excavation:
 - a. The Contractor must ensure that the extent of all buried utilities and services are located and if necessary, protected, prior to any excavation.
 - b. Notify the Contract Administrator immediately upon discovery of any silt pockets or other deleterious material. Over-excavation of any deleterious material and replacement with suitable fill, only upon approval by the Contract Administrator.
 - c. The foundation soil shall be excavated to the minimum depth shown on the Drawings. Obtain the Contract Administrators approval of excavation prior to placement of materials.

- (2) Granular Base:
 - a. Install filter cloth on top of compacted sub grade for length of wall. Width of cloth shall extend 150mm beyond back face of the wall. Pin in place every 750mm O.C. Where joining of fabric pieces is required overlap seam 150mm minimum.
 - b. Place granular base material to the lines and grades shown on the drawings. Extend base minimum of 200 mm beyond front and back faces of wall.
 - c. Compact material to 98% Standard Proctor Density.
 - d. Prepare base to ensure full contact to the base surface of the wall units.

- (3) Barkman Segmental Concrete Retaining Wall Units:
 - a. The bottom row of retaining wall modules shall be placed on the prepared granular base as shown on the Construction Drawings. Care shall be taken to ensure that the wall modules are aligned properly, levelled from side-to-side and front to back and are in complete contact with the base material.
 - b. Follow closely with backfill. Maximum stacked vertical height of wall prior to backfill placement and compaction not to exceed 2 courses.
 - c. The wall modules above the bottom course shall be placed such that the tongue and groove arrangement provides the design batter (i.e. setback) of the wall face. Successive courses shall be placed to create a running bond pattern with the edge of all units being approximately aligned with the middle of the unit in the course below it.
 - d. The wall modules shall be swept clean before placing additional levels to ensure that no dirt, concrete or other foreign materials become lodged between successive lifts of the wall modules.
 - e. The Contractor shall check the level of wall modules with each lift to ensure that no gaps are formed between successive lifts.
 - f. Care shall be taken to ensure that the wall modules are not broken or damaged during handling and placement.
 - g. Top of wall shall be set to the heights shown on the drawings or as directed by the Contract Administrator.

- (4) Geotextile Cloth:

- a. Geotextile cloth shall be installed vertically along the back face of the wall, prior to installation of granular backfill.
- b. Fabric shall be folded back overtop of granular backfill, 450mm minimum.
- c. Where joining of fabric is required overlap seams 300mm minimum.

(5) Granular Backfill:

- a. Place, spread, and compact backfill in such a manner that minimizes the development of slack in the geotextile cloth. Ensure no damage to the geotextile cloth.
- b. Place and compact backfill in maximum lifts of 150mm (6 in.) and compacted to a minimum density of 95% Standard Proctor.
- c. Place clean stone at back of retaining wall modules, minimum width of 300mm (1ft.), as shown on the drawings and as approved by the Contract Administrator.

(6) Finishing Wall:

- a. Coping units shall be secured to the top of the wall with two 10 mm (3/8 inch) beads of the approved flexible concrete adhesive positioned 50 mm (2 inches) in front and behind the tongue of the last course of retaining wall units.

E.7.1.4 Method of Measurement and Basis of Payment

- (1) Supply and Installation of Barkman Concrete Pisa II Retaining Wall Planter as specified in the Schedule of Prices and as shown on the Drawings will be measured on a lump sum basis. The area to be paid for shall be the Barkman Concrete Pisa II Retaining Wall Planters, installed in accordance with this Specification, accepted by the Contract Administrator, as computed in the field by the Contract Administrator.

E.8. TREES, SHRUBS AND GROUND COVER

E.8.1 General Description

- (1) The following list generally describes the scope of this section:
 - .1 Supply and installation of trees, shrubs and ground cover, including preparation, digging, transport and planting.
- (2) The Contractor shall furnish all labour, materials, equipment and services necessary to complete the Work as shown on the drawings and specified herein.

E.8.1.1 Source Quality Control

- (1) Notify Contract Administrator of source of material at least 7 days in advance of shipment. No Work under this Section is to proceed without approval. There shall be no charge to the City for any materials (trees or otherwise) taken by the Contract Administrator for inspection purposes.
- (2) Acceptance of nursery stock at its source does not prevent rejection on Site prior to or after planting operations.
- (3) Nursery stock to be grown in nurseries under proper horticultural practices as recommended by the Canadian Nursery Trades Association.

- (4) Only nursery stock grown for at least the last four (4) years in nurseries located in an Agriculture Canada Plant Hardiness Zone of 2 (a or b) or 3 (a or b) will be accepted. Nursery stock that has grown in plant hardiness zones 1 and 4 or greater will be rejected.

E.8.1.2 Materials

- (1) Water is to be potable and free of minerals that may be detrimental to plant growth.
- (2) Planting soil shall consist of black top soil, a fertile friable natural loam containing by volume not less than 4% and no more than 25% of organic matter for clay loams, and not less than 2% and no more than 25% sandy loams, with an acidity value ranging from pH 6.0 to 8.0 and capable of sustaining vigorous plant growth. Soil is to be free of any mixture of subsoil, clay lumps and free of stones and other extraneous matter. It is not to contain couch or crab grass rhizomes.
- (3) Root ball burlap is to be 150 g Hessian burlap, biodegradable.
- (4) Anti-desiccant is to be a wax-like emulsion to provide film over tree leaf surfaces reducing evaporation but permeable enough to permit transpiration.
- (5) Fertilizer shall be complete synthetic slow release fertilizer with maximum 35% water soluble nitrogen.
- (6) Wound dressing is to be a horticulturally accepted non-toxic, non-hardening emulsion.
- (7) Wire baskets are to be a horticulturally accepted product designed to carry the weight and to contain a burlap-covered root ball. Minimum diameter basket size is to conform to the same maximum diameter of the tree root ball for the respective minimum tree calliper sizes as detailed in the Plant List on Gordon Bell School Planting Plan.
- (8) Bark mulch shall be wood chip mulch free of small branches and leaves and ranging in size from 5mm to 75mm long and 5mm to 20mm thick. Submit sample of mulch for approval by the Contract Administrator prior to shipping to Site.
- (9) Nursery Stock Material
 - .1 Quality and source is to comply with Guide Specification for Nursery Stock, Seventh Edition of Canadian Nursery Trades Association (C.N.T.A.) referring to size and development of plant material and root ball. Measure trees when branches are in their natural position. Height and spread dimensions refer to main body of trees and not from branch top to branch top. Use trees of No. 1 grade.
 - .2 Nomenclature of specified trees is to conform to the International Code of Nomenclature for Cultivated Plants and is to be in accordance with the approved scientific names given in the latest edition of the Standardized Plant Names.
 - .3 All nursery stock to be clearly labelled as to species, size and nursery origin until such time as they have been set in place on Site, and have been approved by the Contract Administrator. After approval, all labels and tags are to be removed by the Contractor.
 - .4 The use of nursery stock requiring treatments as ordered by Agriculture Canada is prohibited.
 - .5 Trees are to be characteristically developed for their species and structurally sound, well branched, healthy and vigorous and densely foliated when in leaf. The tree is to have a healthy, well developed, fibrous root system that may be verified through a testing procedure that destructively samples one or more randomly selected root balls.
 - .6 Trees are to have been root pruned regularly, but not later than one growing season prior to arrival on Site. The Contractor may be required to furnish documentation to the city on his root-pruning program. Trees in excess of 75 mm calliper are to have been half root pruned during each of two successive growing seasons, the latter at least, one growing season prior to arrival on Site.
 - .7 All parts of the trees, especially the lower branches, are to be moist and show live, green cambium tissue when cut.

- .8 Trees are to have only one, sturdy, reasonably straight and vertical trunk, and a well balanced crown with fully developed leader.
 - .9 Trees are to be free of disease, insect infestation, rodent damage, sun scald, frost cracks, abrasions, unhealed scars, scars exceeding 5cm in diameter, major forks or crooks in the trunk, broken branches, or angled leaders. Trees having the above defects, will not be accepted by the Contract Administrator.
 - .10 Trees having a leader, which has developed, at a sharp angle to the trunk as a result of pruning or trunk damage will not be accepted.
 - .11 Trees exhibiting suppressed, weakly developed branches due to competition from other closely spaced trees in the nursery will not be accepted. Trees exhibiting dead branches will not be accepted.
 - .12 Any tree that has come out of dormant stage and is too far advanced will not be accepted unless prior approval obtained. Approval is required for any tree that has been held in cold storage.
 - .13 Balled and burlapped trees in excess of 3m height must have been dug with large firm ball as specified in the Plant List on Gordon Bell School Planting Plan. Roots in root balls must be comprised of 75% fibrous and feeder root systems. Secure root balls with burlap, heavy twine and rope. For trees 75mm or more in calliper, wrap ball in double layer of burlap and drum lace with minimum 10mm diameter rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.
 - .14 Tree spade dug trees are to be dug with mechanized digging equipment with hydraulic spade. Root balls are to satisfy C.N.T.A. Standards. Lift root ball from hole, place in wire basket designed for purpose and lined with burlap. Tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.
 - .15 Use of collected or native trees / shrubs is not permitted.
 - .16 Substitutions to plant material as indicated on planting plan are not permitted unless written approval has been obtained as to type, variety and size prior to award of Contract. Plant substitutions must be similar species and of equal size to those originally specified.
- (10) Nursery Stock Quantity and Size
- .1 The Contractor shall supply plant material at the quantities and callipers as indicated in the Plant List on Gordon Bell School Planting Plan. Any variation from size, calliper and quantity is to be clearly identified on the Schedule of Prices and shall be subject to approval by the Contract Administrator.
 - .2 Nursery Stock to conform to the measurements specified in the Plant List, except that plants larger than specified may be used if approved by the Contract Administrator.
 - .3 Any changes in planting locations will be determined on-site by the Contract Administrator.
 - .4 If larger trees are used, the soil ball for balled and burlapped trees and trees in wire baskets are to be increased in proportion to the size of the tree as herein specified in Gordon Bell School Details Sheet. If larger trees are used then were specified, the Contractor must provide evidence that the trees have been appropriately root pruned.
 - .5 Trees are to be measured when the branches are in their normal position. Height dimensions specified are to refer to the main body of the tree and not from branch tip to root base. Where trees have been measured by calliper or diameter, reference is to be made to the diameter of the trunk measured 15 cm above the ground as the tree stands in the nursery prior to lifting. Calliper of tree shall be clearly identified on a permanently fixed tag on one of the branches.

(11) Plant Lists

.1 The Contractor shall supply plant material as indicated on the Plant List below:

PLANT SPECIFICATION LIST

Quantity	Type	Common Name	Botanical Name	Size	Remarks
1	Tree	little-leaf linden	Tilia cordata	4.0" cal. 3.5-4.0m ht.	Specimen; B&B, upright pyramidal form
2	Tree	amur chokecherry	Prunus maackii	4.0" cal. 3.5-4.0m ht.	Specimen; B&B, upright growth habit
10	Shrub	dwarf cranberry bush	Viburnum opulus 'nanum'	Container, 0.3-0.4m ht.	Specimen; full spreading plants
2	Shrub	dwarf mugo pine	Pinus mugo pumilio	Container, 0.4-0.5m ht.	Specimen; low spreading and bushy plants
10	Shrub	goldflame spirea	Spiraea x bumalda 'goldflame'	Container, 0.3-0.4m ht.	Specimen; mound-like form
11	Ground cover	day lily	Hemerocallis	Container, 0.2-0.3m ht.	Well-formed, upright spreading plants

(12) Shipment and Pre-Planting Care

- .1 Coordinate shipping of nursery stock and excavation of holes to ensure minimum time lapse between digging and planting.
- .2 Tie branches of nursery stock securely, and protect plants against abrasion, exposure and extreme temperature change during transit. Avoid binding of plants with rope or wire which would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of nursery stock during lifting.
- .3 Cover plant foliage with tarpaulin, and protect bare roots by means of dampened straw, peat moss, saw dust or other acceptable material to prevent loss of moisture during transit and storage.
- .4 Remove broken and damaged roots with sharp pruning shears. Make clean cuts, and cover cuts over 10mm diameter with a tree wound dressing.
- .5 Keep roots moist and protected from sun and wind. Heel-in trees which cannot be planted immediately, in shaded areas and water well.

E.8.1.3 Construction Methods

(1) Workmanship

- .1 All areas and locations provided for planting shall be staked according to layout shown on the Drawings. Excavation shall not proceed until the layout has been inspected by the Contract Administrator.
- .2 Apply anti-desiccant in accordance with material manufacturer's instructions.
- .3 Coordinate operations. Keep Site clean and planting holes drained. Immediately remove soil or debris spilled onto street pavement, grass or sidewalk.

(2) Planting Time

- .1 Plant deciduous nursery stock during dormant period before buds have broken. Nursery stock noted for spring planting only, must be planted in dormant period.
- .2 When permission has been obtained to plant deciduous plants after buds have broken, spray plants with anti-desiccant to slow down transpiration prior to transplanting.
- .3 Plant only under conditions that are conducive to health and physical conditions of plants. Planting shall be done during periods of suitable weather conditions and in accordance with locally accepted practice.

- .4 Provide planting schedule to Contract Administrator. Extending planting operations over long period using limited crew will not be accepted.
 - .5 Trees are to be planted within forty-eight (48) hours of excavation from the nursery.
 - .6 Planting program is to be planned to ensure that trees delivered to the Site at designated planting locations are installed and thoroughly watered the same day as delivery.
 - .7 The Contractor must obtain all above and below ground clearances from all the utilities as well as the appropriate District Operations Branch in a timely manner so as not to jeopardise the schedule of the complete tree planting Contract.
- (3) Excavations
- .1 Planting beds shall be excavated with vertical sides to the finished depths and widths as shown on the drawings.
 - .2 All excavated material shall be disposed of off Site.
 - .3 Protect bottom of excavations against freezing.
 - .4 Remove water that enters excavations prior to planting. Ensure source of water is not ground water or from broken City water pipe.
 - .5 No tree pit is to be left open at the end of the Contractor's Work Day.
- (4) Planting Procedure
- .1 Loosen bottom of planting hole to depth of 100-150mm.
 - .2 Plant trees and shrubs vertically. Orient plant material to give best appearance in relation to structure, roads and sidewalks.
 - .3 Place plant material to depth equal to depth they were originally growing in nursery.
 - .4 With balled and burlapped root balls and root balls in wire baskets, loosen burlap and cut away the top 1/3 without disturbing root ball. Do not pull burlap or rope from under root ball. Non-biodegradable wrapping must be removed.
 - .5 Tamp planting soil around root system in layers of 150mm, eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling.
 - .6 Spread bark mulch to a consistent depth over planting beds, taking care not to damage the plants.
 - .7 Build 100mm deep earth saucer around outer edge of hole to assist with maintenance watering.
- (5) Fertilizing
- .1 When planting is completed, give surface of planting saucer dressing of organic 10-6-4 fertilizer at a rate of 12kg/100m for shrub beds or 40 to 50 g/mm of calliper for trees. Mix fertilizer thoroughly with top layer of planting soil and water in well.
- (6) Tree Support
- .1 Trees are to be staked within seven (7) Calendar Days following planting.
 - .2 Trees are to be individually staked with two 2.4m metal T-bars located on the northwest and southeast side of the tree, and connected to the tree trunk with rubber hose or an industry accepted substitute.
 - .3 Stakes are to be driven firmly into undisturbed soil - never the root ball - sufficiently to provide support to the tree.
- (7) Pruning
- .1 The Contractor shall provide a person with a valid Manitoba Tree Pruner's Licence for each Work crew or Work Site.

- .2 Prune nursery stock after planting to compensate for loss of roots suffered during transplanting. Postpone pruning of those plants where heavy bleeding may occur, until in full leaf. Employ clean sharp tools and make cuts flush with main and secondary branch collars, smooth and sloping as to prevent accumulation of water.
- .3 Remove projecting stumps on trunks or main branches. Remove dead and injured branches and branches that rub causing damage to bark. Trim out crown of trees without changing their natural shape. Do not damage lead branches or remove smaller twigs along main branches.
- .4 Prune Deciduous Trees to min 2.4m clear stem height.
- .5 Treat cuts in excess of 20mm diameter and damaged parts with application of industry approved tree wound dressing.

(8) Watering

- .1 Trees and shrubs are to be watered during the planting procedures as described above, and once a week thereafter, or more frequently if required, during the growing season.
- .2 A complete record is to be kept of each series of waterings for all planted trees noting: 1) location, and 2) date of watering. This record is to be given to the Contract Administrator when requested.
- .3 Apply 40 litres of water per 25mm calliper per application using deep root feeder or low/pressure nozzle and hose. The water stream must not gouge out a hole in the soil and mulch.

E.8.1.4 Measurement and Payment

- .1 Supply and installation of Plant Material will be measured on a unit basis. The number of units to be paid shall be the total number of units supplied, installed and maintained in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.
- .2 Plant Material replaced due to non-Contractor accident clause or vandalism will be measured and paid on a unit basis.
- .3 Payment will be made at the Contract Unit Price bid for all plant material that has been inspected and approved by the Contract Administrator. The units to be paid for shall be the total number of units as computed from measurements made by the Contract Administrator. The Contract Price shall be considered to be 80% complete upon Substantial Performance of the Work and 100% complete upon the completion of the 2-year Maintenance period.

E.9. LANDSCAPE MAINTENANCE

E.9.1 General

- .1 This Specification shall cover the one-year maintenance for sod and the two-year maintenance for all plant material from date of Substantial Performance.
- .2 The Contractor shall furnish all labour, materials, equipment and services necessary to complete the Work as shown on the drawings and specified herein.

E.9.1.1 Description of Work

- .1 This Specification shall cover the maintenance of trees and shrubs, planting beds and sodded areas for a period as indicated above from the Certificate of Substantial Performance.
- .2 In general, Work shall include:
 - a) Spring-cleaning
 - b) Fertilizing

- c) Watering
- d) Mowing
- e) Weed Control
- f) Pest and disease control
- g) Tree support repair and adjustment
- h) Tree and shrub pruning
- i) Mulching
- j) Winter preparation

E.9.1.2 Maintenance Schedule

- (1) The Contractor shall provide a complete written Maintenance Schedule to Contract Administrator Prior to the issuing of the Certificate of Substantial Performance by the Contract Administrator.

E.9.1.3 Total Performance

- (1) The Certificate of Total Performance will be issued by the Contract Administrator upon completion of the Second Year of the Maintenance Period provided that the trees are well established and rooted, properly pruned and showing growth and vigour satisfactory to the Contract Administrator
 - ii. Unacceptable trees are to be removed and replaced according to E.9. - Supply and Installation of Trees, Shrubs and Groundcover. Maintenance on a replacement tree shall be extended for the period equal to the original Maintenance Period as specified herein. Further inspection will be made by Contract Administrator after the additional Maintenance Period.
 - iii. Such replacement and Maintenance shall be continued until tree is acceptable.

E.9.1.4 Protection

- (1) Prevent damage to fencing, other trees, landscaping, benches, buildings, pavement, surface and underground utility facilities.

E.9.1.5 Materials

- (1) General
 - .1 Materials are to conform to the requirements of related Specification sections.
- (2) Execution / Methods
 - .1 Herbicide: (for control of weed flushes) "Round-up" or approved equal. Spot treat seeded areas with selective herbicide as required.
 - .2 Fertilizer: complete synthetic slow release fertilizer with maximum 35% water-soluble nitrogen.
 - .3 Condition of Equipment
 - i. Prior to the Award of the Contract, the Bidder will be required to arrange to have the equipment inspected by the Contract Administrator to verify that the equipment is in good operating condition and meets the requirements of the Specifications.
 - ii. The supply of replacement equipment of equal or larger size, if regular units are under repair, will be the responsibility of the Contractor.
- (3) General Workmanship
 - .1 Programming timing of operations to growth, weather conditions and use of Site.
 - .2 Do each operation continuously and complete within reasonable time period.

- .3 Store equipment and materials off site.
- .4 Collect and dispose of debris or excess material on daily basis.
- (4) Spring Cleaning
 - .1 Rake lawn areas and remove dead vegetation, leaves and debris. Do heavy raking with flexible grass rake on areas with "snow mold". Roll lightly areas where grass plants have lifted due to frost action.
- (5) Fertilizing
 - .1 Spread fertilizer evenly at frequency, ratio and rates as recommended by Manufacturer. Use approved mechanical spreading equipment. Check calibration to ensure specified rate is spread evenly. Water immediately after fertilizing. Rectify uneven spreading as soon as it becomes apparent.
- (6) Watering
 - .1 Apply water as required to all landscaped areas to supplement rainfall and to maintain optimum growing conditions. In general, water once a week to achieve rates as indicated. Allow soil to adequately dry between watering to prevent over saturation without creating water stress. Source of water shall be from a water truck, not from a hydrant.
 - .2 Apply water in soft spray to avoid packing of soil. Move sprinklers or adjust irrigation system as required to avoid running of water and return to those areas until moisture penetration has been reached. Do not impede use of sidewalk and other paved areas.
 - .3 Sodded Areas
 - .i During establishment period, water as required to maintain moisture penetration of 150mm. In general, water daily for first week and three times per week for next six weeks. Adjust to suit climatic conditions.
 - .ii Thereafter, water as required to replenish available moisture to a depth of 150mm (approximately 25mm precipitation per week).
 - .iii. Ensure minimum moisture penetration of 150mm for each application.
 - .4 Trees and Shrubs
 - .i Water every other day for first month and every third day for second month after planting. Thereafter, water once per week between May 1 and October 15.
 - .ii A complete record is to be kept of each series of watering for all planted trees noting:
 - a. location
 - b. date of watering
 - .iii. This record is to be given to the Contract Administrator when requested.
 - .iv. Apply 40 litres of water per 25mm calliper per application using deep root feeder or low-pressure open flow nozzle and hose. The water stream must not gouge out a hole in the soil and mulch.
 - .5 Mowing of Lawn Areas
 - .i Mow at regular intervals to a height of between 50-60mm. Do not cut more than 1/3 of the grass height at any one mowing. Cut grass before it reaches 75mm height. Do not remove grass clippings from lawn unless volume is such as to be harmful to lawn or unsightly. Hand trim or use edger for grass adjacent to buildings, pavement, trees, fences. Trim grass edges around planting beds neatly in lines as in original layout.
 - .iv. Lawn cutting operations include picking up and disposal of paper and refuse accumulated on landscaped areas prior to mowing.

- (7) Weed Control
1. Sodded Areas
 - a. Maintain Site free of weeds. Do not allow weeds to establish for a period longer than one (1) week. Do not use herbicide in seeded areas.
 - b. Apply herbicide when it will not cause damage to new grass or other plants. Avoid use of dicambal and picloram solutions near trees and shrubs and seeded areas.
 2. Trees and Shrubs
 - a. Maintain surface of tree pit free of weeds. Do not allow weeds to establish for a period longer than one (1 week).
 - b. Obtain written approval of Contract Administrator prior to using any herbicides.
 - c. Do not use dicambal and picloram solutions near trees.
- (8) Pests and Disease Control
1. Obtain written approval of Contract Administrator prior to using any pesticide.
 2. Control pests and disease through pruning or application of pesticides. Use species specific pesticides where possible. Use only pesticides of low mammalian toxicity. Strictly follow manufacturer's written instructions.
- (9) Cultivating Shrub Beds
1. Cultivate whenever required to keep top layer of soil, loose, friable and free from weeds. Any operation must be continuous without interruption.
 2. Cultivate surface of shrub bed, and soil areas around trees and shrubs.
 3. Remove weeds including their roots.
 4. Take care not to damage roots of shrubs or flowers. Use small hand tools for areas of closely planted shrubs.
 5. Collect and dispose of paper and refuse. Remove dead plants, leaves, branches, dead flowers and seedpods.
 6. Clean, by hand, areas that are covered with mulch. Loosen top layer of mulch without mixing it with soil underneath.
 7. Add mulch as required to maintain specified thickness.
- (10) Tree Supports and Tie Adjustments
1. Maintain tree supports and ties in proper repair.
 2. Remove supports and ties as directed by Contract Administrator.
 3. Straighten any tree that is leaning.
- (11) Tree and Shrub Pruning
1. The Contractor shall provide a person with a valid Manitoba Tree Pruner's License for each Work Crew or Work Site.
 2. Trees as required to remove dead, broken or damaged limbs. Prune back to healthy growth while maintaining balanced crown shape.
 3. Employ clean sharp tools. Make cuts co-incident with the branch collar near the main stem or branch. Cuts must be smooth and sloping to prevent accumulation of water on cut. Do not leave little stumps ("horns") on trunks or main branches.

4. Trees according to accepted horticultural practices as outlined in the Pruning Manual, Publication No. 1505 by Agriculture Canada.

(12) Winter Preparation

1. Rake and assemble leaves after they have been shed by trees. Remove from Site.
2. Protect trees from rodent damage using fine wire mesh or approved plastic protector beyond snow line or by applying rodent repellent sprays.
3. Ensure adequate moisture in root zones of trees material prior to freeze-up.
4. Apply anti-desiccant to evergreen trees susceptible to winter desiccation.

E.9.1.6 Measurement and Payment

- (1) Maintenance shall be considered incidental to the supply and installation of trees and shrubs.

E.9.1.7 Total Performance

- (1) The Certificate of Total Performance will be issued upon completion of the Maintenance Period provided that:
 1. Trees, shrubs and lawn areas are well established and rooted, properly pruned and showing growth and vigour satisfactory to the Contract Administrator.
 2. Unacceptable trees, shrubs or lawn areas are to be removed and replaced according to the required Specifications. Maintenance of replacement items shall be extended for a period equal to the original Maintenance Period as specified herein. Further inspection will be made by the Contract Administrator after the additional Maintenance Period.

E.10. PROTECTION OF EXISTING TREES

E.10.1 General Description

- (1) The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing schoolyard trees within the limits of the construction area:
 - .1 The Contractor shall not stockpile materials and soil or park vehicles and equipment within 2 metres of trees.
 - .2 Trees identified to be at risk by the Contract Administrator are to be stapped with 25x100x2400 wood planks, or suitable protected as approved by the Contract Administrator.
 - .3 Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measures in inches), with the outcome read in feet, from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
 - .4 Operation of equipment within the drip line of the trees shall be kept to a minimum required to perform the Work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the drip lines of trees. The drip line of a tree shall be considered to be the ground surface

directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.

- (2) All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator; and the City Forester or his/her designate.
- (3) No separate measurement or payment will be made for the protection of trees.
- (4) Elm trees cannot be trimmed between April 1 and July 31 inclusive.

E.11. SITE FURNISHING

E.11.1 Description

- (1) This specification shall cover the supply and installation of Site Furnishings. The Contractor shall furnish all labour, materials, equipment and services necessary to complete the Work as shown on the drawings and specified herein. These items shall include the supply and installation of:
 - (a) Benches
 - (b) Picnic Tables
 - (c) Waste Receptacles
 - (d) Benching on Planter Unit

E.11.1.1 Materials

- (1) General
 - (a) All materials supplied under this specification shall be of a type approved by the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.
- (2) Shop Drawings
 - (a) Shop drawings are required for all custom-made furnishings, including customized benching.
 - (b) Drawings showing all sizes and dimensions, position and spacing of reinforcing, openings, connection details, layout plan, all inserts, and all other relevant information showing immediate adjacent materials for proper coordination shall be submitted to the Contract Administrator within two weeks after award of the contract and prior to fabrications for review and approval by the Contract Administrator. Five copies of each drawing shall be provided.
- (3) Definitions
 - (a) Dumor Recycled Plastic is a high-density polyethylene product, derived from post-consumer bottle waste.
 - (b) TREX is a product made from recycled plastic grocery bags, reclaimed pallet wrap and waste wood. It is an enduring seating or decking material, as it requires no stains or sealants for protection, will not rot or deteriorate due to harsh weather, is splinter free and resists moisture, insects and sunlight.
- (4) Products
 - (a) Bench:

Bench shall be Dumor "Recycled Plastic Bench 138", 8' long (138-80), with steel pipe supports, stainless steel fasteners and 2" x 4" nom. recycled plastic slats. Finish for steel supports shall be black polyester powder coating. Colour for slats shall be "Grey".
 - (b) Picnic Table:

Picnic table shall be Dumor "Recycled Plastic Pedestal Table 76", 4' sq., 4 seats (76-34PL), with 4" square x 3/16" steel tube centre post, 2-1/2" square x 1/4" wall steel tube and 1/4"-thick steel angle frame, stainless

steel fasteners and 3" x 4" nom. recycled plastic slats. Finish for steel supports shall be black polyester powder coating. Colour for slats shall be "Grey". Support option shall be S-1 embedment.

(c) Waste Receptacle:

Waste receptacle shall be Dumor "Recycled Plastic Receptacle 40", 32-gallon Receptacles (40-32), with flat plastic cover, plastic liner, plastic lid and 2" x 4" nom. recycled plastic slats. Finish for steel support shall be black polyester powder coating. Colour for slats shall be "Grey". Support option shall be S-1 embedment.

(d) Benching on Planter Unit:

(a) Concrete Segmental Retaining Wall Units:

a. The concrete wall modules shall be Barkman Concrete Pisa II as shown on the Construction Drawings and as follows:

- .1 Pisa II Standard Unit 12"D x 6"H x 8"W ("Natural" colour)
- .2 Pisa II Corner Unit 12"D x 6"H x 9"W ("Natural" colour)

(b) Foundation Soil:

a. The foundation soil shall be the native undisturbed on site soil.

(c) Granular Base:

a. The footing shall be non-frost susceptible, compacted granular base course material, $\frac{3}{4}$ " down, in accordance with requirements of base course material specified in CW 3110-R7.

(d) Granular Backfill:

a. The backfill material shall be a free draining angular granular material of uniform particle size smaller than 25 mm (1 in.).

(e) Slats:

a. All bench slats shall be 2" x 4" x 39" nom., TREX recycled plastic / wood. Colour shall be "Winchester Grey".

E.11.1.2 Source

(1) Dumor site furnishings, sizes and finishes as stated above:

GAT Home Company Ltd.
Neil Buller
289 King Street
Winnipeg, MB
R3B 1J8
Ph: (204) 946-0729
Fax: (204) 947-3800

(2) Barkman Concrete Pisa II Retaining Wall, sizes and finish as stated above:

Barkman Concrete
909 Gateway Road
Winnipeg, MB
R3K 3L1
Ph: (204) 667-3310
Fax: (204) 663-4854

- (3) TREX recycled plastic / wood slats, sizes and finish as stated above:

TREX Easy Care Decking
www.trex.com
Ph: 1-800-289-8739

E.11.1.3 Construction Methods

- (1) General
- (i) Fit and ship assemble in largest practical section, for delivery to Site.
 - (ii) Supports shall be a minimum 300mm below ground, set in the centre of the hole. Backfilled crushed limestone down shall be crowned or domed to shed water.
 - (iii) All exposed welds shall be ground smooth and flush with adjacent finished surfaces.
- (2) Benches
- Benches shall be set into concrete bases in locations as noted on the plan or as directed by the Contract Administrator and in accordance with the manufacturer's instructions, and shall be set plumb and level.
- (3) Picnic Tables
- Picnic tables shall be set on gravel pads in locations as noted on the plan or as directed by the Contract Administrator and in accordance with the manufacturer's instructions, and shall be set plumb and level.
- (4) Waste Receptacles
- Waste receptacles shall be set into concrete bases in locations as noted on the plan or as directed by the Contract Administrator and in accordance with the manufacturer's instructions. The waste receptacle units shall be secure and level.
- (5) Benching on Planter Unit
- (a) Excavation:
 - i. The Contractor must ensure that the extent of all buried utilities and services are located and if necessary, protected, prior to any excavation.
 - ii. Notify the Contract Administrator immediately upon discovery of any silt pockets or other deleterious material. Over-excavation of any deleterious material and replacement with suitable fill, only upon approval by the Contract Administrator.
 - iii. The foundation soil shall be excavated to the minimum depth shown on the Drawings. Obtain the Contract Administrators approval of excavation prior to placement of materials.
 - (b) Granular Base:

- i. Place granular base material to the lines and grades shown on the drawings. Extend base minimum of 200 mm beyond front and back faces of wall.
- ii. Compact material to 98% Standard Proctor Density.
- iii. Prepare base to ensure full contact to the base surface of the wall units.

(c) Barkman Segmental Concrete Retaining Wall Units:

- i. The bottom row of retaining wall modules shall be placed on the prepared granular base as shown on the Construction Drawings. Care shall be taken to ensure that the wall modules are aligned properly, levelled from side-to-side and front to back and are in complete contact with the base material.
- ii. Follow closely with backfill. Maximum stacked vertical height of wall prior to backfill placement and compaction not to exceed 2 courses.
- iii. The wall modules above the bottom course shall be placed such that the tongue and groove arrangement provides the design batter (i.e. setback) of the wall face. Successive courses shall be placed to create a running bond pattern with the edge of all units being approximately aligned with the middle of the unit in the course below it.
- iv. The wall modules shall be swept clean before placing additional levels to ensure that no dirt, concrete or other foreign materials become lodged between successive lifts of the wall modules.
- v. The Contractor shall check the level of wall modules with each lift to ensure that no gaps are formed between successive lifts.
- vi. Care shall be taken to ensure that the wall modules are not broken or damaged during handling and placement.
- vii. Top of wall shall be set to the heights shown on the drawings or as directed by the Contract Administrator.

(d) Granular Backfill:

- i. Place and compact backfill in maximum lifts of 150mm (6 in.) and compacted to a minimum density of 95% Standard Proctor.
- v. Backfill material shall be placed behind the retaining wall modules, filling void between benching wall and planter wall, as shown on the drawings and as approved by the Contract Administrator.

(e) Installation of Benching:

- i. TREX recycled plastic / wood slats shall be secured to the top of the wall, as indicated in the drawings.

E.11.1.4 Method and Measurement of Payment

- (1) Benches, picnic tables and waste receptacles will be measured on a unit price basis.
- (2) Benches, picnic tables and waste receptacles will be paid for at the Contract Unit Prices. The amount to be paid for shall be the total number of units, measured as specified

herein. This price shall be full payment for supplying all labour, equipment and materials, and performing all operations herein described and all other items incidental to the Work and as accepted by the Contract Administrator.

- (3) Supply and Installation of Benching on Planter Unit as specified in the Schedule of Prices and as shown on the Drawings will be measured on a square meter basis.
- (4) Supply and Installation of Benching on Planter Unit will be paid for at the Contract Unit Price for each square meter, which price shall be payment in full for supply of all material and performing all operations herein described and for all other items incidental to the Work included in this Specification.