SEPTEMBER 23, 2020

REQUEST FOR PROPOSAL

For the supply, installation, maintenance of the Bala GS Park

RFP 2020-01-2
Swift River Energy Limited

FOR THE SUPPLY, INSTALLATION, MAINTENANCE OF THE BALA GS PARK

You are invited to submit a Proposal for the supply, installation and maintenance of the Park adjacent to the Bala Generating Station.

Should you have any questions regarding the specifications or the process, technical inquiry, request to visit, or any other questions related to this RFP, please contact:

Nhung Nguyen
VP Development
Swift River Energy Limited
416-864-3951
nnguyen@horizonlegacy.com
www.balafalls.ca

Project address:
3105 Muskoka District Road 169
Bala, ON. P0C 1A0
Closest intersection: Bala Falls Rd & MR 169

Please only provide an electronic submission.

THE POWER PLANT

Swift River Energy Limited (SREL) is the owner and operator of the Bala Generating Station, a 4.7MW hydro electric run of river power plant.

Every year, the Bala GS generates enough electricity to power 2000 homes locally. The project has a low environmental footprint and was built at the site of an old power station that existed from 1924-1972.

Bala's power plant was architecturally conceived and designed by Harvard trained architect Karl Stevens under the advise and input of a Design Committee composed of 8 members of the community. A motivating force for the design was to connect the two parts of Bala with improved public and pedestrian access. The new building incorporates sloped roofs and overhangs often found in Muskoka architecture. The power plant has muted brick exteriors and large windows that allow visitors to see clean electricity being generated for the region.

A new observation deck allows for unobstructed views of the Moon River and the falls. Visitors to Bala will be invited to tour the facility, immerse in its history and explore the inner workings of the power plant. Additional parking spots have been created along MR 169 at Bala Falls Rd.

THE PARK

The scope of this RFP is the supply, installation, and maintenance of the park next door to the power plant. The park is being built by SREL on lands owned by the Township of Muskoka Lakes. The designated green space known as 'Portage Landing' is being rehabilitated. In 1965 with the realignment of MR 169 the steep embankment made the traditional portage route ineffective and severely limited public access to the site. This will be changed when the park is completed and opened to the public for enjoyment.

Together, the Park, the Observation Deck and Margaret Burgess Park will grant the public, visitors and locals with unparalleled, unobstructed views down the Moon River in the heart of Bala. Jane Burgess, an architect who specializes in heritage preservation was retained to ensure heritage features of the 'Portage Landing' site are preserved. The traditional public uses, landing and launching of canoes, picnicking and other recreational uses, are being restored.

The current park plans was approved by the Heritage Committee and Township of Muskoka Lakes Council prior to 2017. After the 2 year warranty, maintenance of the park will be turned over to the Township.

Scope

1. To build a park as outlined in Schedule B and C, the Landscape Plan and Landscape Specification, supply all top soil, plant material, installation and labour.
2. Provide a 2 year warranty on the Works.
3. Permanently mount and place the Bala Boulder, referenced in Schedule B as 9/L3 "Heritage Engraved Monolithic Stone". See also Schedule A diagram 8.

Engineering Specs

Additional civil and geotechnical engineering specs will be provided at a later stage and prior to SREL and the winning bidder entering into a contract. These may include:

- erosion and sediment control;
- sub-grading;
- engineering base grading drawings and details.

Proposal Submission

- Minimum three (owner/approval authority contact) references and project descriptions and construction values for comparable (value, type and complexity) projects. Comparable projects should include projects of similar complexity, including waterfront parks and restoration projects including hardscape components, sites with substantial slope and complex access requirements and naturalization landscape projects.
- Timeline and schedules for completion
- Names and resumes for each team member
- All taxes, if any are to be shown separately

Expression of Interest

The deadline for expressing interest and proving a bid is October 21, 2020 at 12:00PM/ noon. Please send expression of interest to Nhung Nguyen at nnguyen@horizonlegacy.com

Bid Closing

The deadline for submission of bid price is November 18, 2020 at 12:00PM/ noon. Please send bid submission to Nhung Nguyen at nnguyen@horizonlegacy.com

Completion Date

Work shall be completed no later than June 30, 2021.

CCDC

The winning submission and SREL will enter into a standard CCDC 2 form of contract, as outlined in Schedule D.

Reporting and Inspections

SREL, its Landscape Architect, and a representative from the Township of Muskoka Lakes will be entitled to visit and inspect the Work on an as needed basis.

By accepting the contract, the successful proponent agrees to coordinate their work with SREL and any site contractor and shall provide the necessary documentation in terms of insurance, WSIB coverage, and schedules.

Schedules

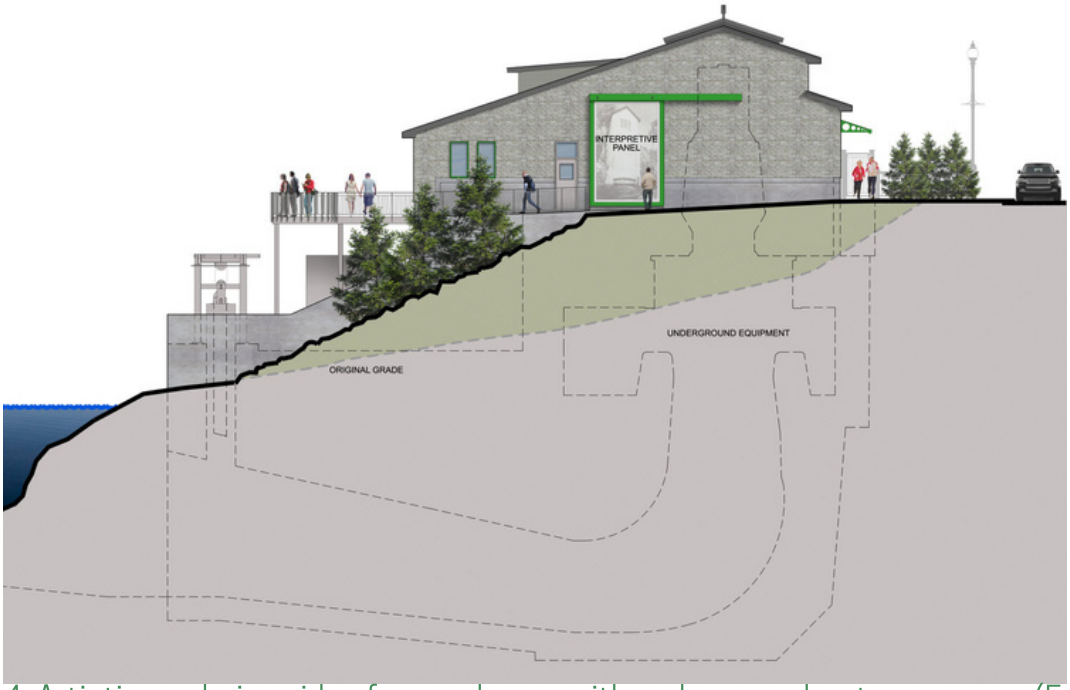
- Schedule A - Site Sketches, Drawings and Photographs
- Schedule B - Landscape Plan, Portage Landing Parket & Restoration prepared by Kendall Flower Landscape Architecture, May 2020
- Schedule C - Landscape Specification, prepared by Kendall Flower Landscape Architecture, May 2020
- Schedule D - CCDC2e Form of Contract

Schedule A

1.Power plant and park lands, looking towards north

2. Power plant and park lands, view from Moon River looking towards east

3. Front of Power House



4. Artistic rendering side of power house with underground water passage. (For clarity, no power plant infrastructure is located on park lands)

5. General site layout

6. Diver's Point

7. Across the street from power house

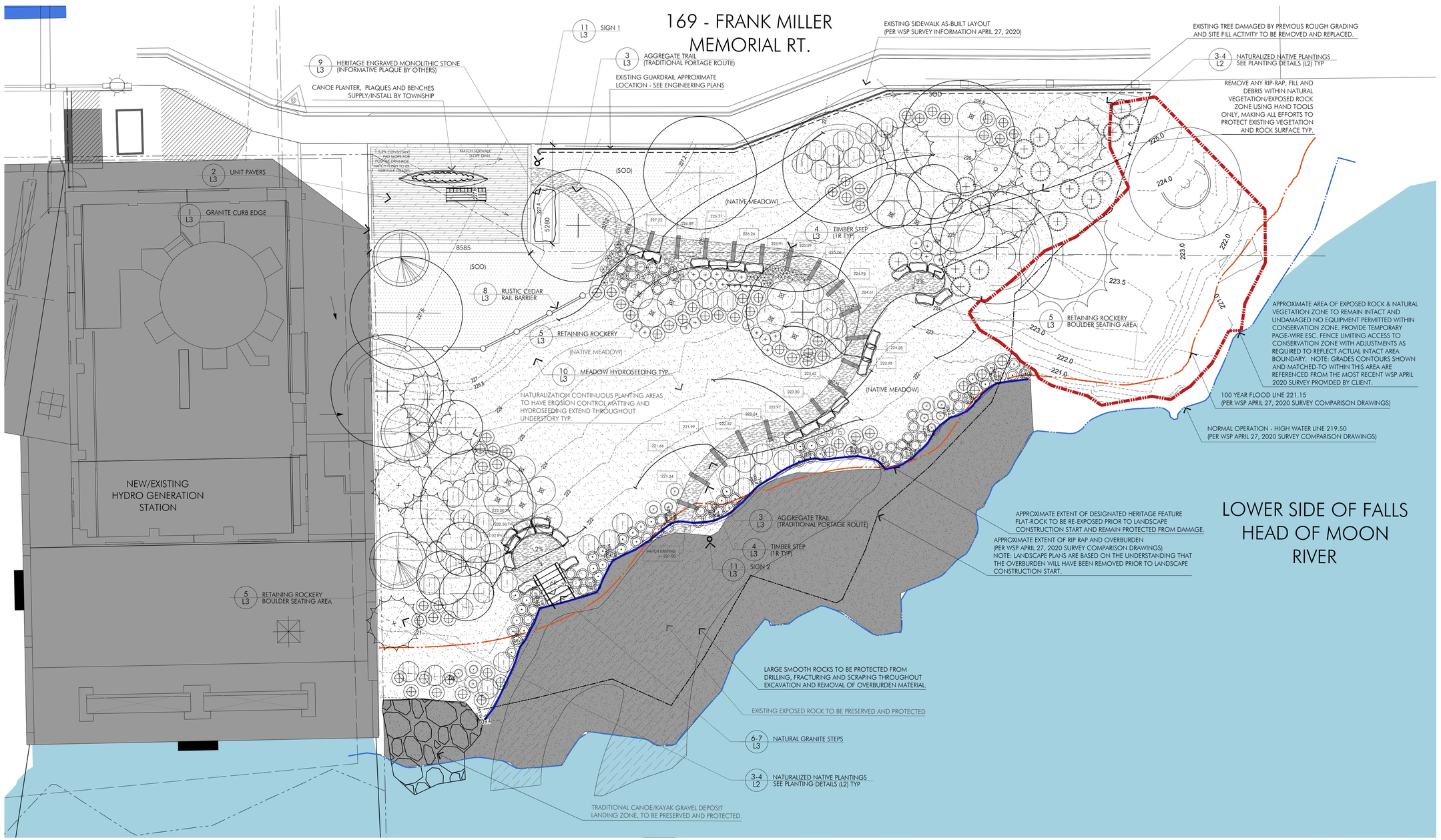
8. Bala Boulder

9. Site as of July 13, 2020. View from south

10. Site as of July 13, 2020. Looking downward toward water

Schedule B

169 - FRANK MILLER MEMORIAL RT.

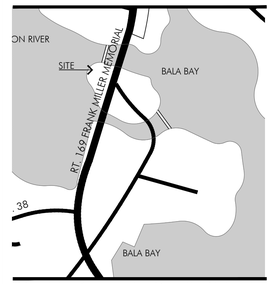


NOTES:
- DRAWINGS ARE TO BE READ IN CONJUNCTION WITH LATEST WRITTEN SPECIFICATION SET.
- CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND REPORTING ANY DISCREPANCIES TO THE CONSULTANT PRIOR TO PROCEEDING WITH WORK.

PLANTING & TOPSOIL:
- REMOVE EXISTING FILL AS REQUIRED TO OBTAIN FINAL CONTOUR GRADES & FOR INSTALLATION OF MINIMUM TOPSOIL DEOTHS REQUIRED FOR PLANTINGS.
- MINIMUM TOPSOIL DEPTH BY AREA:
  - EACH TREE PIT: MIN. 2m X 2m X 1m DEPTH TOPSOIL
  - SHRUB BED RESTORATION PLANTING AREAS: MIN. 600mm DEPTH TOPSOIL
  - NATIVE MEADOW SEEDING AREAS: MIN. 200mm DEPTH TOPSOIL. (NOTE NATIVE SEEDING TO EXTEND THROUGHOUT UNDER-STORY OF SHRUB PLANTING ZONES).

SLOPE STABILIZATION & EROSION CONTROL:
- GRADES PROVIDED ARE CONCEPTUAL ONLY. FINAL GRADING PLAN TO BE REVIEWED BY CIVIL/GEOTECHNICAL ENGINEER FOR SLOPE STABILITY.
- PROPOSED CONCEPTUAL GRADES MEET THE
- PROVIDE TEMPORARY EROSION CONTROL SILT FENCING (CLEAR STONE WEIR WRAPPED IN FILTER CLOTH) ALONG BOTTOM OF SLOPE THROUGHOUT DURATION OF CONSTRUCTION AND UNTIL ALL MEADOW SEEDING AREAS HAVE ACHIEVED A MINIMUM OF 80% GERMINATED COVERAGE.
- PROPOSED STRAW MAT EROSION CONTROL MEASURES REQUIRE GEOTECHNICAL ENGINEER REVIEW, APPROVAL, SEAL AND SITE REVIEW FOR ENSURED SLOPE STABILITY AND PREVENTION OF EROSION/SEDIMENTATION OF WATER COURSE.
- CONTRACTOR TO OBTAIN ENGINEER MEMO OF SLOPE STABILITY PRIOR TO CONSTRUCTION.

CONTRACTOR TO ENSURE THAT ALL WORKS CONFORM WITH ALL APPLICABLE CODES AND REGULATIONS.
- NOTE THAT THE UPPER AREAS OF THE PARK ARE REQUIRED TO MEET AODA (ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT). STANDARDS FOR UNIVERSAL ACCESSIBILITY.
- THE ACCESS ROUTE TO BOTTOM OF SLOPE QUALIFIES AS A RECREATIONAL TRAIL UNDER THE AODA. ALTHOUGH THE TRAIL IS UNABLE TO MEET UNIVERSAL ACCESSIBILITY STANDARDS, IT IS THE OWNER/OPERATOR (TOWNSHIP'S) RESPONSIBILITY TO MEET REQUIREMENTS FOR COMMUNITY CONSULTATION ON PARK ACCESSIBILITY MEASURES, INCLUDING POTENTIAL SIGNAGE AND NOTIFICATIONS (EX. TACTILE WARNING INDICATOR SURFACE) ON APPROACH TO THE INACCESSIBLE TRAIL. TOWNSHIP RECOMMENDED SIGNAGE/ACCESSIBLE ACCOMODATION FEATURES (TO BE DETERMINED) TO BE INCORPORATED INTO THE DETAILED DRAWING & SPECIFICATION SET.



We have relied upon the accuracy and completeness of base & background information provided by the following Consultants in preparing this drawing and performing our professional services.

WSP Global Inc. Stevens Burgess Architects Ltd.

We are under no obligation or duty to verify the accuracy and/or completeness of this information and have not done so.
We shall not be held responsible for any errors or omissions that may arise or be incorporated as a result of erroneous or incomplete information provided by the Client, Consultants and Contractors.

LEGEND

- EXISTING TREE (DAMAGED) TO BE REMOVED AND REPLACED
- EXISTING TREE TO REMAIN AND PROTECTED
- NATIVE MEADOW HYDROSEEDED AREAS REFER TO DETAIL.
- SOD
- UNIT PAVER PLAZA
- 227 — DESIGN CONTOURS - REFERENCED FROM APRIL 25, 2020 SURVEY BY WSP ENGINEERING DRAWINGS REFER TO ORIGINAL DRAWING TO ENSURE LATEST VERSION. NOTE: IT IS OUR ASSUMPTION THAT THE SITE WILL BE PROVIDED TO THE LANDSCAPE CONTRACTOR AT DESIGN GRADES MINUS REQUIRED TOPSOIL DEPTHS OF 300mm DEPTH THROUGHOUT OPEN MEADOW AREAS AND 600mm THROUGHOUT SHRUB PLANTING ZONES.
- 222.0 — AS BUILT/EXISTING CONTOURS REFERENCED FROM APRIL 25, 2020 SURVEY BY WSP SHOWN WITHIN APPROX. EXTENTS OF REMAINING NATURAL EXPOSED ROCK AND VEGETATION AREA TO REMAIN AND BE PROTECTED FROM CONSTRUCTION ACTIVITY.

No.	Date (Y/M/D)	Issue / Revision	By
5	200611	ISSUED FOR TENDER	KF
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info@kendallflower.com
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Project Title:
PORTAGE LANDING PARKET & RESTORATION

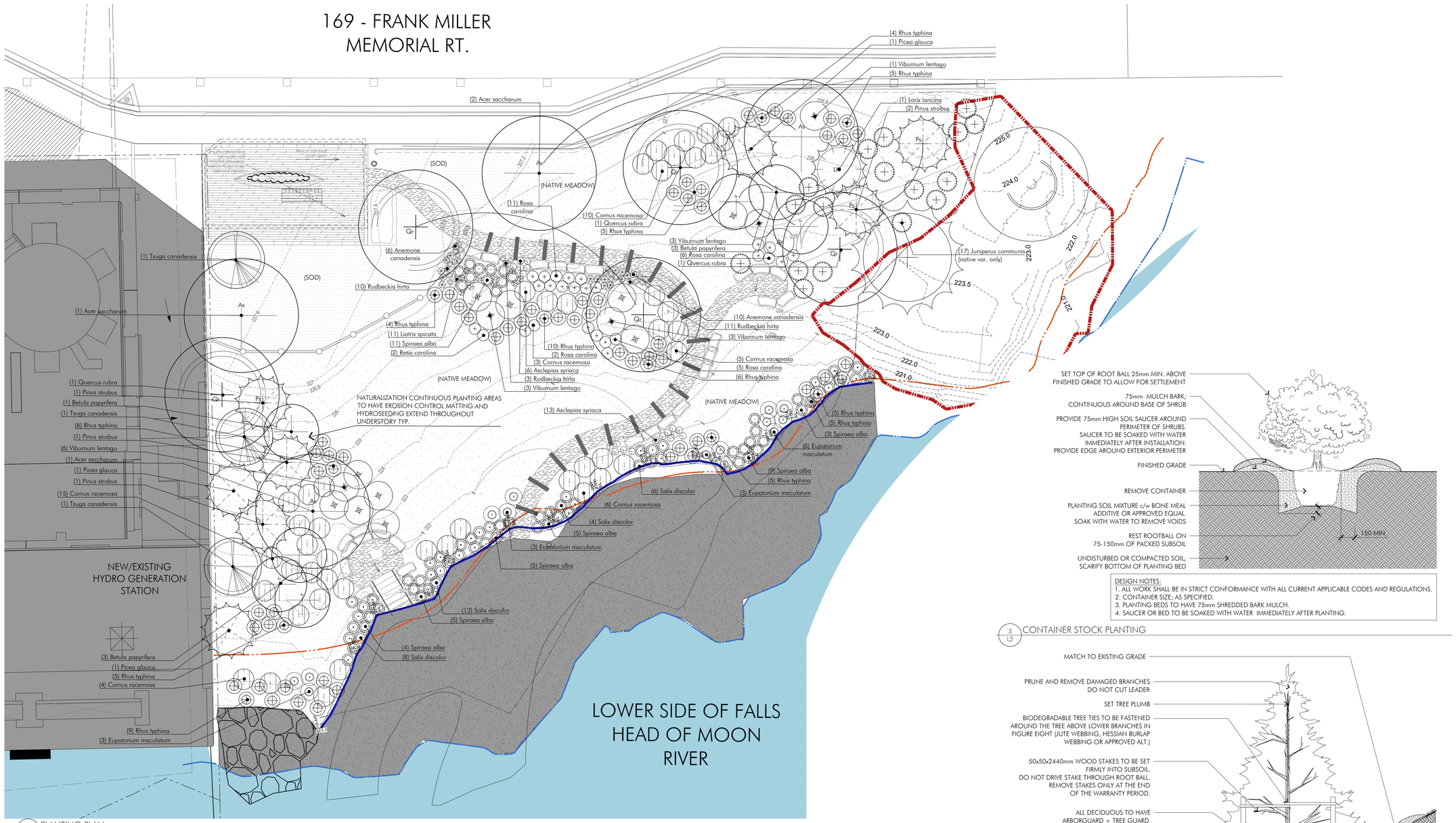
Client Info:
Horizon Legacy Group
60 St. Clair Ave. E. Suite 300, Toronto, ON

Sheet Title:
LANDSCAPE PLAN

Project Number:	1822
Drawn By:	kf
Checked By:	kf
Date:	May 2020
Scale:	1:100

Sheet Number: L1

169 - FRANK MILLER MEMORIAL RT.



1 L2 PLANTING PLAN
1:100

PERENNIALS						
QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE-CAL	ROOT	REMARKS	NATIVE
19	Asclepias syriaca	Common Milkweed	4" pot	Cont.	Full, dense plant	YES
24	Rudbeckia hirta	Black Eyed Susan	1 Gallon	Cont.	Full, dense plant	YES
14	Eupatorium maculatum	Common Joe Pye Weed	2 Gallon	Cont.	Full, dense plant	YES
16	Anemone canadensis	Canada Anemone	1 Gallon	Cont.	Full, dense plant	NO
11	Liatris spicata	Dense Blazing Star	1 Gallon	Cont.	Full, dense plant	NO

DECIDUOUS SHRUBS						
QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE-CAL	ROOT	REMARKS	NATIVE
46	Cornus racemosa	Grey Dogwood	50cm Ht./3 Gallon min.	Cont.	Evenly branched, Min. 3 Canes	YES
64	Rhus typhina	Staghorn Sumac	1 Gallon	Cont.	Min. 3 canes, full, dense plant	YES
26	Rosa carolina	Pasture Rose	3 Gallon	Cont.	Full, dense plant	YES
36	Salix discolor	Pussy Willow	1 Gallon	Cont.	Full, dense plant	YES
42	Spiraea alba	Narrow Leaved Meadowsweet	40cm Ht./2 Gallon min.	Cont.	Full, dense plant	YES
16	Viburnum lentago	Nannyberry	50cm Ht./3 Gallon min.	Cont.	Full, dense plant	YES

CONIFEROUS SHRUBS							
QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE-CAL	ROOT	REMARKS	DROUGHT TOLERANCE	NATIVE
17	Juniperus communis (native var., hybrids will be rejected)	Canadian Common Juniper	50cm Spr./3 Gallon min.	Cont.	Full, dense plant	HIGH	YES

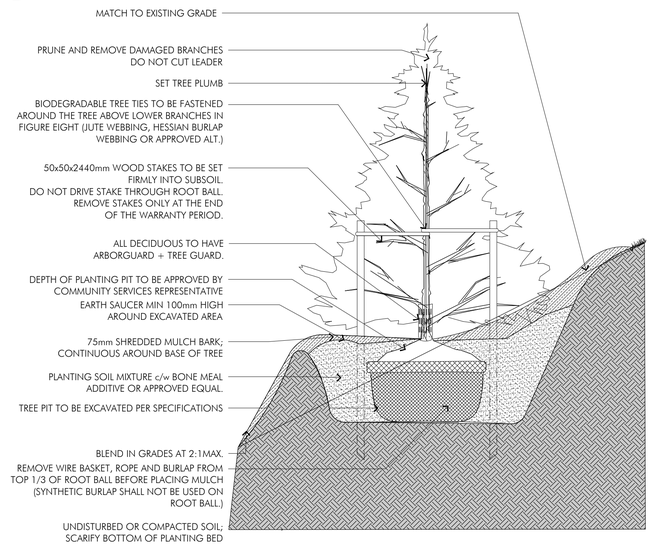
DECIDUOUS TREES						
QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE-CAL	ROOT	REMARKS	NATIVE
4	Acer saccharum	Sugar Maple	70mm Cal.	W.B.	Straight trunk, evenly branched heads	YES
7	Betula papyrifera	White Birch, Paper Birch	150cm ht.	CONT.	Straight trunk, evenly branched heads	YES
5	Quercus rubra	Red Oak	70mm Cal.	W.B.	Straight trunk, evenly branched heads	YES

CONIFEROUS TREES						
QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE-CAL	ROOT	REMARKS	NATIVE
1	Larix laricina	Tamarack Larch	200cm ht.	W.B.	Straight, evenly branched, dense plants	YES
3	Picea glauca	White Spruce	200cm ht.	W.B.	Straight, evenly branched, dense plants	YES
5	Pinus strobus	White Pine	200cm ht.	W.B.	Straight, evenly branched, dense plants	YES
3	Tsuga canadensis	Eastern Hemlock	200cm ht.	W.B.	Straight, evenly branched, dense plants	YES

2 L2 PLANTING SCHEDULE

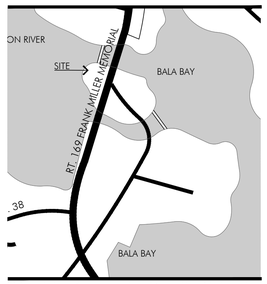
DESIGN NOTES:
1. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH ALL CURRENT APPLICABLE CODES AND REGULATIONS.
2. CONTAINER SIZE; AS SPECIFIED.
3. PLANTING BEDS TO HAVE 75mm SHREDDED BARK MULCH.
4. SAUCER OR BED TO BE SOAKED WITH WATER IMMEDIATELY AFTER PLANTING.

3 L2 CONTAINER STOCK PLANTING



GENERAL NOTES:
1. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH ALL CURRENT APPLICABLE CODES AND REGULATIONS.
2. HAND DIG PLANTING HOLE AND LOOSEN SURFACE SOIL.
3. ALLOW FOR SETTLEMENT WHEN SETTING PLANTS, SET PLANTS 50mm HIGHER THAN ADJACENT FINISHED GRADE.
4. BACKFILL SOIL IN 150mm LIFTS AND HAND TAMP TO PREVENT AIR POCKETS.
5. CAREFULLY REMOVE ANY LOOSE SOIL FROM TOP OF ROOT BALL.

4 L2 TREE PLANTING ON SLOPE



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DO NOT SCALE DRAWING

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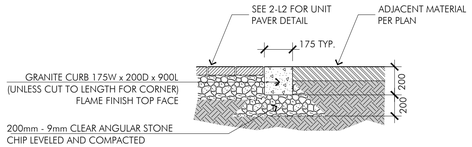
Horizon Legacy Group
60 St. Clair Ave. E. Suite 300, Toronto, ON

Sheet Title:
PLANTING PLAN

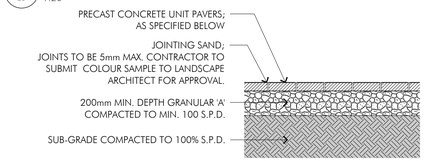
Project Number:	1822
Drawn By:	kf
Checked By:	kf
Date:	May 2020
Scale:	1:100

Sheet Number: L2

1822 200609 LP IFC New Base

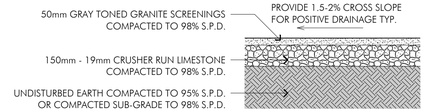


1 L3 GRANITE CURB FLUSH EDGE
1:20



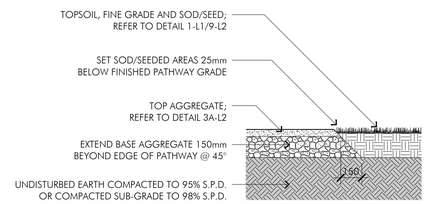
GENERAL NOTES:
1. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH ALL CURRENT APPLICABLE CODES AND REGULATIONS.
2. ENSURE A CLEAN, FLUSH TRANSITION BETWEEN ADJACENT PAVING.
3. PAVERS TO BE FOLLOWING:
   - 3.1. PROMENADE PLANK PAVER BY UNILOCK (SIZE: 6 x 24 x 2.75 (REQS. ORDER LEAD TIME)) (COLOUR: GRANITE BLEND ii. CAMPO FINISH)
   - 3.2. LAYING PATTERN: RUNNING BOND

2 L3 TYPICAL UNIT PAVERS ON AGGREGATE BASE
1:20



GENERAL NOTES:
1. REFER TO DRAWING L1 FOR PATHWAY LAYOUT & LINEAR SLOPE.
2. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH ALL CURRENT APPLICABLE CODES AND REGULATIONS.
3. ENSURE A CLEAN, FLUSH TRANSITION BETWEEN ADJACENT MATERIALS & SURFACING.
4. ENSURE THAT PATHWAY GRADES AND CROSS SLOPE PROVIDE POSITIVE DRAINAGE AND ADHERE TO GRADING PLAN (WHERE APPLICABLE).

3A L3 AGGREGATE TRAIL
1:20



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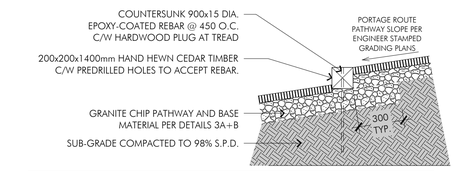
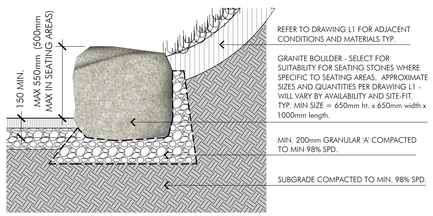
3B L3 AGGREGATE TRAIL
1:20

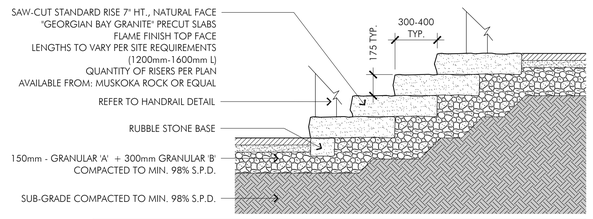


GENERAL NOTES:
1. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH ALL CURRENT APPLICABLE CODES AND REGULATIONS.
2. REFER TO PLAN FOR ADJACENT SURFACING MATERIALS.
3. ALL JOINTS TO BE STRAIGHT, CLEAN, VERTICAL AND FREE OF BROKEN OR LOOSE MATERIAL.
4. ENSURE A CLEAN, FLUSH TRANSITION BETWEEN ADJACENT MATERIALS
5. ALL TIMBER TO BE TREATED WITH C.C.A. TO CSA 080-14 AND AWPA STANDARDS M1, M2 & M4 @ 6.4/M3 FOR GRD.
   - PILING CREOSOTE 8LB/CF RETENTION
   - ALL OTHER WOOD CRESOTE 8LB/CF RETENTION OF PENTA-CHLOROPHENOL OR 4LB/CF OF CHROMATED COPPER ARSENATE.
6. ALL TIMBER TO BE OF THE SAME MATERIAL AND STRUCTURALLY SOUND. MEANING FREE OF DECAY, WORMHOLES AND LARGE CHECKS.
7. HARDWOOD TIES TO BE BEECH, MAPLE, ASH, OAK OR BIRCH.
8. SOFTWOOD TIES TO BE JACK PINE, RED PINE, PONDEROSA PINE, DOUGLAS FIR OR WESTERN HEMLOCK.
9. WHERE NAILING IS REQUIRED, GALVANIZED NAILS TO BE USED THROUGHOUT.

4 L3 TIMBER STEP
1:20



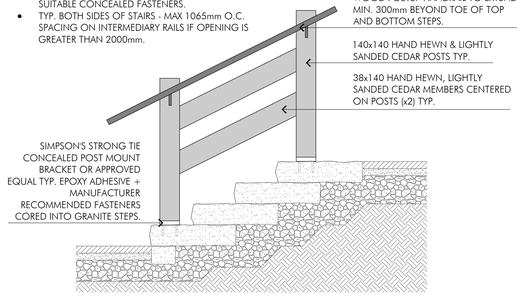
5 L3 GRANITE BOULDER SEATING & RETAINING ROCKERY
1:20



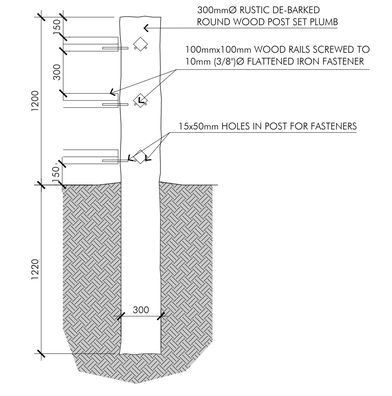
GENERAL NOTES:
1. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH ALL CURRENT APPLICABLE CODES AND REGULATIONS.
2. REFER TO PLAN FOR RUN LENGTH OF STAIRS AND FOR NUMBER OF RISERS.
3. REFER TO PLAN FOR ADJACENT MATERIALS.
4. ENSURE A CLEAN, FLUSH TRANSITION BETWEEN STAIRS AND ADJACENT MATERIALS.
5. SLOPE TREADS TO ENSURE POSITIVE DRAINAGE, MAXIMUM 2%.

6 L3 GRANITE STEPS
1:20

NOTES:
- ALL WOOD TO BE NO.1 GRADE WESTERN RED CEDAR, NATURAL/UNFINISHED
- ALL FASTENERS TO BE HOT DIPPED GALVANIZED STEEL.
- ALL WOOD:WOOD CONNECTIONS TO BE MADE USING SUITABLE CONCEALED FASTENERS.
- TYP. BOTH SIDES OF STAIRS - MAX 1065mm O.C. SPACING ON INTERMEDIARY RAILS IF OPENING IS GREATER THAN 2000mm.

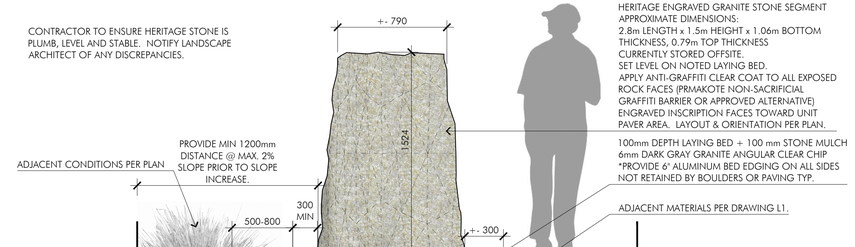


7 L3 RUSTIC CEDAR HANDRAILS
1:20



NOTES:
ALL WOOD TO BE WESTERN RED CEDAR, NATURAL/UNFINISHED
DIRECT BURY POSTS MIN. 1220 DEPTH.
ALTERNATIVE ACCEPTABLE FASTENING METHOD: MORTIS & TENON

8 L3 RUSTIC CEDAR RAIL BARRIER
1:20



9 L3 HERITAGE ENGRAVED MONOLITHIC STONE
1:20

Medium Height Native Meadow Mix

Percentage	Botanical Name	Common Name	Apprx. Height
10%	Carex pennsylvanica	Pennsylvania Sedge	0.6m ht
5%	Carex platyphilla	Silver Hedge	0.5m ht
2%	Luzula acuminata	Hairy Wood Rush	0.3m ht
22%	Schizachyrium scoparium	Little Bluestem	0.6m ht
15%	Bouteloua curtipendula	Side Oats Grama	0.5m ht
5%	Monarda punctata	Spotted Bee Balm	0.5m ht
5%	Aster novae-angliae	New England Aster	0.5m ht
13%	Rudbeckia hirta	Brown-Eyed Susan	0.6m ht
15%	Solidago nemoralis	Grey Goldenrod	0.5m ht
2%	Allium cernuum	Nodding wild onion	0.4m ht
2%	Aquilegia canadensis	Wild Columbine	0.5m ht
2%	Coreopsis lanceolata	Lance-leaved Coreopsis	0.4m ht.
2%	Asclepias syriaca	Common Milk Weed	0.8m ht.

Apply at a rate of 26kg.ha

Cover Crop:

33.30%	Acena sativa	Common Oats
33.30%	Fagopyrum esculentum	Buckwheat
33.30%	Lolium multiforum	Annual Rygrass*

* Note not to be confused with Perennial Rye (Lolium perenne)

Apply at a rate of 20kg.ha

NOTE - CUSTOM SEED MIX PREPARED FOR LOCAL SPECIES APPROPRIATENESS AND LOW-GROW MEADOW HEIGHT. SUBSTITUTIONS AND ALTERNATE SUPPLIERS WILL NOT BE ACCEPTED

ALL SEEDING TO BE HYDRO-SEED APPLICATION PER SPECIFICATION

ALL SEEDED AREAS TO HAVE MINIMUM 300mm DEPTH SUITABLE TOPSOIL. NATIVE TOPSOIL IS RECOMMENDED FOR USE FOLLOWING TESTING TO ENSURE SUITABLE NUTRIENT, DRAINAGE AND PH LEVELS. NATIVE TOPSOIL STOCKPILES ARE RECOMMENDED FOR 3 SEPARATE, UNBLENDED SAMPLES TO GEOTECHNICAL ENGINEER SOIL TESTING SERVICE OR AGRIFOODS CANADA FROM EACH STOCKPILE FOR CONFIRMATION OF SUITABILITY

ALL DISTURBED AREAS SHOULD BE SEEDED AS SOON AS POSSIBLE FOLLOWING THE COMPLETION OF WORKS. BIODEGRADABLE EROSION CONTROL MATTING (TERRAFIX WOOD-300-DOUBLE NET OR APPROVED EQUAL) TO BE INSTALLED ON ALL SLOPES OF 20% OR GREATER AND MUST REMAIN IN PLACE. REFER TO MANUFACTURER/SUPPLIER INSTALLATION DETAILS.

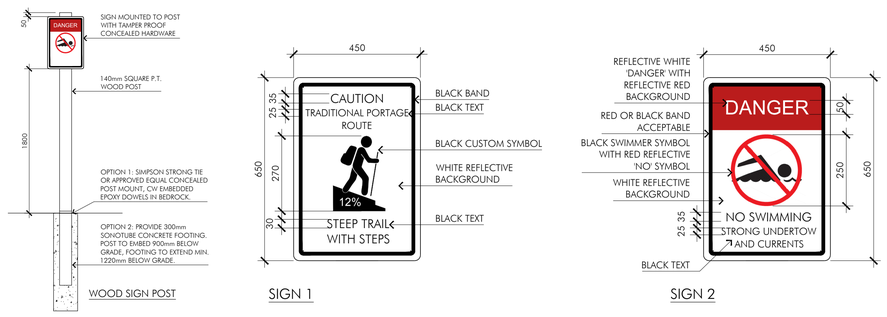
SEEDING SHOULD NOT BE EXECUTED DURING THE DROUGHT-PRONE SEASON (JUNE THROUGH AUGUST). TIME TOPSOIL INSTALLATION TO BE IMMEDIATELY FOLLOWED BY SEEDING AND EROSION CONTROL MATTING INSTALLATION.

NOTE:

Hydroseed Native Meadow Seed Mix
Minimum 300mm native topsoil is required for all are
For slopes greater than 30% an approved erosion control blanket or hydro-seeding tactifier shall be applied
Complete slurry to be applied per hectare:

i)	seed (mixture as specified)	26 kg
ii)	mulch	1000 kg
iii)	water (minimum)	10 000 litres
iv)	fertilizer	450 kg

10 L3 NATIVE LOW-GROW MEADOW SEED MIX



11 L3 SIGNAGE
NTS

No.	Date (Y/M/D)	Issue / Revision	By
5	200611	ISSUED FOR TENDER	KF
4	200610	REVISED PER UPDATED SITE & SURVEY INFORMATION	KF
~~3~~	~~190109~~	~~ISSUED FOR CONSTRUCTION~~	~~KF~~
2	190104	ISSUED FOR CLIENT REVIEW	KF
1	181001	DRAFT ISSUED FOR TEAM COORDINATION	KF

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Project Info:
PORTAGE LANDING PARKET & RESTORATION

Client Info:
Horizon Legacy Group
60 St. Clair Ave. E. Suite 300, Toronto, ON

Sheet Title:
LANDSCAPE DETAILS

Project Number:	1822
Drawn By:	kf
Checked By:	kf
Date:	May 2020
Scale:	1:100

Sheet Number: L3

Schedule C

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 31 22 19 Rough Grading
.2 Section 31 23 10 Excavating, Trenching and Backfilling
.3 Section 32 92 23 Sodding

1.1 References

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment

.1 PN1340-[2005], Guidelines for Compost Quality.

1.2 Definitions

.1 Compost:

.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.

.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.

.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminates.

.4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

1.3 Submittals

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Quality control submittals:

.1 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 Quality assurance

.1 Topsoil from each source, native and imported shall be tested for N.P.K., altrazine, monor elements as well as clay and organic matter contents and acidity (PH) range. Topsoil shall be tested, written test report received and approved by Consultant prior to delivery to site. Contractor to allow minimum three-weeks lead time for Consultant to submit samples and await laboratory test results prior to installation date.

.2 Topsoil to be free from invasive and noxious weeds including but not limited to: Phragmites, Brassicaceae from within the Garlic Mustard family, vetch, and burdock.

1.5 Waste management and disposal

.1 Divert unused soil amendments from landfill to official hazardous material collections site approved by Owner.

.2 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

PART 2 PRODUCTS

2.1 Topsoil in sodded areas, meadow areas and planting beds

.1 Topsoil for sodded areas and planting beds: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

.2 Topsoil shall be fertile, friable natural loam containing not less than 4% of organic matter to a maximum of 10% by weight.

Topsoil to have an acidity value ranging from a Ph of 5.5 to a Ph of 7.0.

Topsoil to have a sand content of 60-80% by weight.

Topsoil to have a maximum combined silt/clay content of 35% by weight.

Topsoil to be capable of sustaining vigorous plant growth and to be free from subsoil, roots, vegetation, debris, toxic materials, invasive species seeds and weeds and stone over 50mm diameter. Topsoil containing crabgrass, couch grass, noxious weeds including invasive species is not acceptable.

.3 Topsoil to be screened prior to delivery to site.

.4 Fertilizer:

.1 Complete commercial synthetic fertilizer as required by soil tests.

.5 Limestone:

.1 Ground agricultural limestone containing minimum 85% of total carbonates.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.6 Elemental Sulphur:

.1 Sulphur comprised of ninety (90) percent Sulphur and ten (10) percent Bentonite Clay.

.2 Consistence: friable when moist.

2.2 Soil amendments

.1 All soil amendments where specified shall be thoroughly and evenly blended to provide uniform consistency of final soil mixture.

.2 Fertilizer:

.1 Fertility: major soil nutrients present in following amounts:

.2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.

.3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.

.4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.

.5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.

.6 Ph value: by soil blend/location

.3 Peatmoss or Coconut Husk Coir:

.1 Elastic and homogeneous, brown in colour.

.2 Free of wood and deleterious material which could prohibit growth.

.3 Shredded particle minimum size: 5 mm.

.4 Sand: washed coarse silica sand, medium to course textured.

.5 Aggregate: Pea gravel 12mm dia. Round Clear.

.6 Organic matter: compost Category A, in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.7 Limestone:

.1 Ground agricultural limestone.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.8 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 Source quality control

.1 Advise Consultant of sources of topsoil to be utilized with sufficient lead time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P,K and CEC and organic matter.

.4 Contractor to bare all costs for testing required for initially non-conforming laboratory results requiring further soil amendments.

.5 Testing of topsoil will be carried out by a testing laboratory approved by Consultant.

.1 Soil sampling, testing and analysis to be in accordance with Provincial Standards.

PART 3 EXECUTION

3.1 Stockpiling of topsoil prior to use

.1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.

.2 Stockpile in off-site location unless otherwise agreed to at pre-construction meeting.

.1 Stockpile height not to exceed 2 m.

.3 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill as directed by Consultant and at the expense of the Contractor.

.4 Protect stockpiles from contamination and compaction.

3.2 Preparation of existing grade

.1 Verify that grades are correct.

.1 If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches and stones in excess of 50 mm diameter and other deleterious materials.

.1 Remove debris which protrudes more than 25 mm above surface.

.2 Dispose of removed material off site.

.4 Cultivate entire subsoil area which is to receive topsoil to minimum depth of 100mm.

.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.3 Placing and spreading of topsoil/planting soil

.1 Place topsoil after Consultant has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 100 mm between compaction.

.3 For seeded areas keep topsoil at finished grade.

.4 Spread topsoil as indicated to following minimum depths after settlement.

.1 900mm or depth of root ball to a diameter of minimum 1500mm surrounding each tree (tree pits).

.2 600mm minimum for naturalized shrub planting areas.

.3 300mm minimum for meadow seeding only areas.

.5 Manually spread topsoil/planting soil around obstacles.

3.4 Finish grading

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by Consultant.

.1 Leave surfaces smooth, uniform and firm against deep foot-printing.

3.5 Acceptance

.1 Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.6 Surplus material

.1 Dispose of materials not required off site.

3.7 Cleaning

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

.2 Leave all adjacent hard surfaces swept and washed clean of topsoil.

.3 Hydroseed complete with erosion control matting and sod to be installed immediately following topsoil installation and inspection. Time topsoil installation to coincide with suitable planting times.

End of Section

PART 1 GENERAL

1.1 References

.1 OPSS1001 (2013) Material Specification for Aggregates - General

.2 OPSS 1004(2012) Material Specification for Aggregates – Miscellaneous

.3 OPSS 1010 (2013) Material Specification for Aggregates - Base, Subbase, Select Subgrade,

1.2 Submittals

.1 Submit:

.1 Joint sand sample for colour matching to pavers

.2 Obtain approval of samples from Consultant prior to installation.

1.3 Delivery, Storage and Handling

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Store materials in accordance with supplier's recommendations.

.3 Replace defective or damaged materials with new at no cost to Client.

PART 2 PRODUCTS

2.1 Granular Base

.1 Applicable to locations with unit pavers on aggregate base. See landscape drawings for locations.

.2 The granular base material shall be Granular A to the depth specified in details.

2.2 Bedding Sand

.1 Applicable to unit pavers on aggregate base only. See landscape plans for locations.

.2 Bedding sand shall be in accordance with OPSS 1002 for fine aggregates, except that the gradation shall be as follows:

Table 1: Bedding Sand Gradation

Sieve Number	Percent Passing
1.18 mm	50-85
600 µm	25-60

300 µm	10-30

.3 Limestone screenings or stone dust shall not be used.

2.3 Polymeric Jointing Sand

.1 Polymeric sand shall be blended native sands according to ASTM C144 sand mixed with synthetic polymers for pavement joint stabilization.

2.4 Concrete Unit Pavers

.1 Concrete pavers shall be in accordance with CSA A231.2

.2 Concrete pavers shall be uniform in size and texture. Units having imperfections, chipped edges or cracks shall not be used.

2.5 The manufacturer, product, colour and finish shall be:

.1.

.1 Manufacturer: Unilock (Available from Unilock, Georgetown)

.2 Product: Promenade

.3 Colour: Granite Blend

.4 Size: (6x24x2.75) (Contractor is responsible for allowing sufficient lead time)

.5 Orientation: Running bond, direction per landscape drawings.

.2 Each individual paver shall have a compressive strength of not less than 50MPa and the average of five units shall not be less than 55MPa.

.3 Concrete pavers shall have test date provided, proving compliance with CSA A23.2-11C for water absorption. The average absorption of the product test shall not be greater than 5 percent and no individual paver shall be greater than 7 percent.

PART 3 EQUIPMENT

.1 Concrete pavers shall be set into the bedding sand using a high frequency, low amplitude, mechanical flat plate vibratory compactor having a plate area sufficient to cover a minimum of 12 pavers (200 mm x 200 mm). The compactor shall transmit an effective force of not less than 75 kN per square metre of plate area. The frequency of vibration shall be within the range of 75 to 100 Hz.

PART 4 CONSTRUCTION

4.1 Excavation

.1 Prior to any excavation, the Contractor shall have all utilities located and clearly marked, including an area way locate to mark all underground tunnels, rooms, access points and so on. The excavation shall be to the lines and grades shown on the Contract Drawings.

All surplus or unsuitable material is to be disposed of, off the site, according to OPSS 180.The subgrade shall be prepared according to section 32 11 23 Base Course Aggregate. The Contractor shall be required to make good all damage caused during the course of the construction to any part of the site or surrounding area and to restore the same, to as good or better condition as existed prior to commencement of work.

4.2 Granular Base

.1 Granular base shall be placed in depths of 200 mm and shall be compacted to a minimum of 100% of maximum standard proctor density.

4.3 Bedding

.1 Applicable to unit pavers on aggregate base only. See landscape plans for locations.

.2 The bedding sand shall be placed loosely, in a uniform layer with sufficient depth to achieve the final compacted thickness of 20to 30 mm. The bedding sand shall be screeded in a loose condition and protected against compaction prior to placement of the concrete pavers. Concrete pavers shall be placed only on loose, moist bedding sand.

4.4 Unit Paver Placement

.1 Unit pavers shall be installed in the specified pattern. Concrete pavers shall be placed uniformly and hand tight, such that all joints are correctly aligned. Where concrete pavers require trimming, they shall be cut with a quick-cut saw or a guillotine, to give a straight edge.

4.5 Unit Paver Compaction

.1 Applicable to unit pavers on aggregate base only. See landscape plans for locations.

.2 After placement on aggregate base, compactive effort shall be applied to the concrete pavers until bedding sand is compacted to achieve the proper grade and the pavers are free of movement. At least three passes of a plate compactor shall be made across the surface of the concrete pavers. After initial compaction, dry joint sand shall be broomed to fill in the joints and spread uniformly over the concrete pavers to a depth of not less than 5 mm. At least two passes of a plate compactor shall be applied to the surface while simultaneously sweeping the sand into the joints. Water shall be sprinkled over the sand to ensure proper compaction. Joints shall be completely filled at the completion of compaction. Excess sand shall then be removed from the pavement surface by brooming

PART 5 QUALITY ASSURANCE

5.1 SURFACE TOLERANCE

.1 The surface of the concrete pavers shall be such that when tested with a 3 m long straightedge, placed in any direction on the surface, the gap between the straightedge and the surface of the pavers shall not be greater than 3 mm, at any point.

5.2 ACCEPTANCE

.1 If any pavers are loose, chipped or unevenly cut pavers will be rejected. Areas failing to meet the requirement for surface tolerance will be rejected. Any rejected pavers or areas shall be removed and either reinstalled or replaced by the Contractor. All costs associated with the removal, reinstallation and replacement of rejected concrete pavers shall be at no extra cost to the City.

END OF SECTION

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 31 23 10 Excavating, Trenching and Backfilling
.2 Section 31 23 13 Rough Grading

1.3 References

.1 Ontario Provincial Standard Specifications (OPSS)
  .1 OPSS1001 (2013) Material Specification for Aggregates - General
  .2 OPSS 1004(2012) Material Specification for Aggregates - Miscellaneous
  .3 OPSS 1010 (2013) Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material

1.4 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

1.5 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 Aggregate Screenings: Granite screenings shall be composed of clean, hard durable particles of natural screenings resulting from the crushing of rock, stone or gravel and shall be free of clay, silt or other objectionable material meeting all OPSS Standards 1001, 1004 and 1010.

.2 Material shall meet the following gradation requirements:

PERCENTAGE PASSING BY DRY WEIGHT		
SIEVE SIZE	% PASSING	ALLOWABLE LIMITS %
9.50 mm	100.0	100
4.75 mm	99.8	50-100
2.36 mm	79.1	
1.18 mm	48.3	20-55
600.0 um		
300.0 um	22.5	10-30
150.0 um		
75.0 um	7.0	0-12
um = 1 micron = 1/1000 mm		

PART 3 EXECUTION

3.1 Installation

.1 Stake out the proposed area of surfacing in accordance with the drawings.

.2 Compact sub-grade to 98% Standard Proctor Density

.3 Place subbase as detailed.

.4 Place limestone screenings to a uniform depth as indicated on the drawings and compact to 98% Standard Proctor Density.

3.2 Testing

.1 Inspection and compaction tests of sub-base and limestone Control screenings as well as composition tests of the limestone screenings to determine conformance with gradation requirements listed in item 2.1.2 of this section, shall be carried out by an independent testing laboratory.

.2 Sub-base tests shall be submitted to the Consultant for review prior to the installation of the limestone screenings.

3.3 Maintenance

.1 Maintain all work to the desired grade and thickness for duration of project warranty.

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 22 19 Topsoil Placement and Fine Grading.

1.2 SUBMITTALS

.1 Provide product data to Consultant for pre-approval for:

- .1 Seed
- .2 Mulch
- .3 Tackifier
- .4 Fertilizer

.2 Submit in writing to Consultant seven (7) working days prior to commencing work:

- .1 Volume capacity of hydraulic seeder in litres.
- .2 Amount of material to be used per tank based on volume.
- .3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.

.3 Submit in writing to Owner's Representative within seven (7) working days following installation:

- .1 Shipping slips from seed supplier
- .2 Shipping slips from hydraulic seed installation supplier/sub-contractor

1.3 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

.4 Contractor Qualifications:

- .1 Landscape Planting Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Softscape Installation designation or equivalent.
- .2 Landscape Maintenance Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Turf Maintenance designation or equivalent.
- .3 Provide proof of qualifications when requested by Owner's Representative.

1.4 SCHEDULING

.1 Schedule hydraulic seeding to coincide with preparation of soil surface.

.2 Do not install hydraulic seeding between June 15 and August 31st to avoid periods of summer drought.

.3 Immediately upon completion of hydraulic seeding, erosion control blanketing is to be installed in accordance with details.

1.5 WARRANTY

.1 All areas hydroseeded under this contract shall have a warranty period of two (2) years from the date of Certificate of Substantial Performance shall cover any defects in materials and workmanship or damages caused by the elements of weather. All defects shall be repaired to the satisfaction of the Consultant at no cost to the Owner.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.

.3 Inoculant containers to be tagged with expiry date.

.4 Store fertilizer indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.5 Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.

.1 Seed Mixture per landscape contract drawings.

.1 Contractor to submit mixture composition to Consultant for approval.

.2 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:

.1 Type I mulch:

.1 Made from wood cellulose fibre.

.2 Organic matter content: 95% plus or minus 0.5%.

.3 Value of pH: 6.0.

.4 Potential water absorption: 800-900%.

.2 Type II mulch:

.1 Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.

.3 Tackifier: water dilutable, liquid dispersion.

.4 Water: free of impurities that would inhibit germination and growth.

.5 Fertilizer:

.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".

.2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.

PART 3 EXECUTION

3.1 WORKMANSHIP

.1 Do not spray onto structures, signs, guide rails, fences, plant material, utilities and other than surfaces intended.

.2 Clean-up immediately, any material sprayed where not intended, to satisfaction of Owner's Representative.

.3 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.

.4 Do not perform work between June 15 and August 31 to avoid periods of Summer drought unless otherwise directed in writing by the Owner's representative.

.5 Protect seeded areas from trespass and mowing until plants are established (one year of establishment).

3.2 PREPARATION OF SURFACES

.1 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.

.2 Fine grade areas to be seeded free of humps and hollows. Ensure areas are free of deleterious and refuse materials.

.3 Cultivated areas identified as requiring cultivation to depth of 25 mm.

.4 Ensure areas to be seeded are moist to depth of 150 mm before seeding.

.5 Obtain Owner's Representative approval of grade and topsoil depth before starting to seed.

3.3 FERTILIZING PROGRAM

.1 Fertilize prior to fine grading incorporating fertilizer equally distributed in accordance with an agreed program between Contractor and Owner's Representative.

.2 Fertilize during establishment and warranty periods to an agreed program between Contractor and Owner's Representative.

3.4 PREPARATION OF SLURRY

.1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Owner's Representative. Supply equipment required for this work.

.2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.

.3 After all materials are in the seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

3.5 SLURRY APPLICATION

.1 Hydraulic seeding equipment:

.1 Slurry tank.

.2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and or mechanical agitation method.

.3 Pumps capable of maintaining continuous non-fluctuating flow of solution.

.4 Supplied with not less than 6 spray pattern nozzles.

.5 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.

.6 Tank volume to be certified by certifying authority and identified by authorities "Volume Certification Plate".

.2 Slurry mixture applied per hectare.

.1 Seed: Grass mixture 150 kg.

.2 Mulch: Type I 1250 kg.

.3 Tackifier: 20 kg.

.4 Water: Minimum 30,000 L.

.5 Fertilizer: 600 kg, ratio 5-20-20.

.3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.

.1 Using correct nozzle for application.

.2 Using hoses for surfaces difficult to reach and to control application.

.4 Do not blend application into adjacent grass areas or sodded areas. Maintain a distinct line between meadow seeded areas and sodded areas.

.5 Re-apply where application is not uniform.

.6 Remove slurry from items and areas not designated to be sprayed.

.7 Protect seeded areas from trespass satisfactory to Owner's Representative.

3.6 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Protect seeded areas from trespass and mowing throughout the warranty period with use of protection devices (600mm ht. wood stake & white rope temporary surrounding barrier).

.2 Remove protection devices as directed by Owner's Representative.

.3 Perform following operations from time of seed application until acceptance by Owner's Representative.

.4 Meadow Mixture:

.1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.

.2 Control weeds by manual hand-removal a minimum of 3x per growing season throughout the warranty period.

.3 Water seeded area to maintain optimum soil moisture level for germination and continued growth of meadow. Control watering to prevent washouts.

3.7 ACCEPTANCE

.1 Seeded areas will be accepted by Consultant provided that:

.1 Seeded areas are uniformly established to minimum 90% coverage. Seeded areas are free of rutted, eroded, bare or dead spots.

.2 Areas are free from weeds (plants not included in the seed mix).

.2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.8 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations until acceptance of Certificate of Total Performance.

.1 Water seeded area to maintain optimum soil moisture level for continued growth. Control watering to prevent washouts.

.2 Repair and reseed dead or bare spots to satisfaction of Owner's Representative.

.3 Fertilize seeded areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

.4 Eliminate weeds by manual hand-removal.

.5 Maintain temporary protection devices.

.6 At the end of the warranty period repeat items 2-4.

3.9 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 31 22 19 Topsoil Placement and Fine Grading

1.2 Submittals

.1 Submit:

.1 Sod sample

.2 Bio-degradable straw mat erosion control sample.

.2 Obtain approval of samples from Consultant prior to installation.

1.3 Quality Assurance

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

.4 Contractor Qualifications:

.1 Landscape Planting Supervisor: Landscape Horticulturist or Landscape Industry Certified Technician.

.2 Landscape Maintenance Supervisor: Landscape Horticulturist or Landscape Industry Certified Technician or equivalent.

.3 Provide proof of qualifications when requested by Owner’s Representative.

1.4 Scheduling

.1 Schedule sod installation between September 15 and October 31 in accordance with project schedule.

.2 Schedule sod laying to coincide with preparation of topsoil surface.

1.5 Delivery, Storage and Handling

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Store materials in accordance with supplier's recommendations.

.3 Replace defective or damaged materials with new.

.4 For palletized sod products:

.1 Sod shall not be dumped or dropped from vehicle.

.2 Provide wind protection measures to protect sod during transportation against wind exposure and to prevent drying.

.3 Ensure sod freshness and healthy conditions when they arrive on site.

.4 Provide weather protection measures as required to keep sod fresh and moist, if installation is to be delayed.

.5 Sod is to be delivered to the site within 36 hours of harvest, and be installed within 24 hours of delivery.

.6 Allow sod to dry sufficiently after becoming water logged to prevent tearing or damage during handling.

PART 2 PRODUCTS

2.1 Materials

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Number one Named Cultivars: Nursery Sod grown from certified seed. Kentucky Bluegrass/Fine Fescue blend.

.2 Turf Grass Nursery Sod Quality:

.1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 40 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

.2 Commercial Grade Turf Grass Nursery : Sod that has not been grown as Turfgrass Nursery Sod crop.

.1 Mow sod at height directed by Owner’s Representative within 36 hours prior to lifting, and remove clippings.

.3 Sod establishment support on slopes greater than 3:1:

.1 Fully biodegradable landscape stakes/pins, 150mm length. Each piece of sod shall have (3) three stakes, one stake 100mm from each end, and one in the centre. Stakes shall be driven flush with the sod.

.4 Water:

.1 Supplied by Owner’s Representative at designated source.

.2 Potable, free of impurities.

.5 Fertilizer:

.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".

.2 Complete, synthetic, slow release with 65% of nitrogen content in water-insoluble form.

2.2 Source Quality Control

.1 Obtain approval from Consultant of sod at source.

.2 When proposed source of sod is approved, use no other source without written authorization.

PART 3 EXECUTION

3.1 Preparation

.1 Verify that grades are correct and prepared in accordance with Section 31 22 19 Topsoil Placement and Fine Grading. If discrepancies occur, notify Consultant.

.2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.

.3 Fine grade surface free of humps and hollows to smooth, even grade, to contours and elevations indicated, to tolerance of plus or minus 8 mm, for Turfgrass Nursery Sod, and plus or minus 15 mm for commercial grade turfgrass nursery, surface to drain naturally.

.4 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site in location as directed by Owner's Representative.

.5 Cultivate fine grade approved by Owner's Representative to 25mm depth immediately prior to sodding.

3.2 Sod Placement

.1 Lay sod during active growing season for type of sod. Laying sod during dry, freezing, or over frozen soil is unacceptable.

.2 If growing medium surface is dry, it shall be lightly moistened immediately before laying sod.

.3 Lay sod flush with adjoining grass areas, paving and top surface of curbs, unless shown otherwise on the drawings.

.4 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.5 Lay sod sections in rows, longitudinally, along contours of slopes, joints staggered a minimum 25 mm. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.6 Roll sod as directed by Owner's Representative. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade and gaps are not permitted.

3.3 Sod Placement On Slopes And Pegging

.1 Start laying sod at bottom of slopes.

.2 Lay sod sections longitudinally, along contours of slopes as indicated.

.3 Install pegs/stakes on sodded areas of 3:1 or greater:

.1 Fully biodegradable landscape stakes/pins, 150mm length.

.2 Each piece of sod shall have (3) three stakes, one stake 100mm from each end, and one in the centre.

.3 .Not less than 9 pegs per square metre.

.4 Not less than 12 pegs per square metre in drainage structures. Adjust pattern as directed by Owner's Representative.

.5 Drive stakes flush with sod.

3.4 Fertilizing Program

.1 Fertilize during establishment and warranty periods to following program agreed to by Client.

3.5 Maintenance Until Substantial Completion

.1 Perform following operations from time of installation until acceptance.

.2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.

.3 Cut grass to 50 mm when or prior to it reaching height of 75 mm. Remove clippings as directed by Owner's Representative.

.4 Maintain sodded areas weed free.

.5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

3.6 Acceptance

.1 Sod areas will be accepted by the Consultant provided that:

.1 The noted Sod variety/blend has been installed.

.2 Sodded areas are properly established.

.3 Sod is free of bare and dead spots, and without weeds.

.4 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50 mm.

.5 Sodded areas have been cut minimum 2 times, and within 24 h prior to acceptance.

.6 Fertilizing in accordance with fertilizer program has been carried out at least once.

.2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

.3 When environmental conditions allow, all sodded areas showing shrinkage cracks shall be top-dressed and seeded with a seed mix matching the original.

3.7 Maintenance During Warranty Period

.1 Repair and re-sod dead or bare spots to satisfaction of Owner's Representative.

3.8 Cleaning

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 23 10 Excavating, Trenching and Backfilling

.2 Section 31 22 19 Topsoil Placement and Fine Grading.

1.2 REFERENCES

.1 Canadian Nursery Landscape Association (CNLA)

.1 Canadian Standards for Nursery Stock.

1.3 SOURCE QUALITY CONTROL

.1 Obtain approval from Owner's Representative of plant material upon delivery to site, prior to digging.

.2 Notify Owner's Representative of delivery date for material at least seven (7) days in advance of shipment. No work under this section is to proceed without approval.

.3 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificate: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical characteristics.

.3 Pre-installation meetings: conduct pre-installation meetings to verify project requirements, installation instructions and warranty requirements.

.4 Qualifications: Provide proof of qualifications when requested by Owner's Representative.

.5 Contractor Qualifications:

.1 Landscape Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Softscape Installation designation or equivalent.

.2 Landscape Maintenance Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Ornamental Maintenance designation or equivalent.

1.5 SHIPMENT AND PRE-PLANTING CARE, STORAGE AND PROTECTION

.1 Co-ordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.

.2 Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of plant stock with rope or wire which would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of large trees during lifting.

.3 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 10 mm diameter with wound dressing.

.4 Keep roots moist and protected from sun and wind. Heel-in trees and shrubs, which cannot be planted immediately, in shaded areas and water well

.5 Protect plant material from frost, excessive heat, wind and sun during delivery.

.6 Protect plant material during transportation:

.1 When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/hr, tie tarpaulins around plants or over vehicle box.

.2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/hr. use enclosed vehicle where practical.

.3 Protect foliage and root balls using Anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

.7 Protect stored plant material form frost, wind and sun as follows:

.1 For bare root plant material preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.

.2 For pots and containers, maintain moisture level in containers.

.3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

1.6 WARRANTY

.1 The contractor will warrant that plant material as itemized on the drawings will remain free of defects for two (2) full growth seasons.

.2 Owner's Representative reserves the right to extend contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

.3 Intermediate and End-of-warranty inspection will be conducted.

1.7 SUBMITTALS

.1 Submit product data for:

.1 Fertilizer

.2 Anti-desiccants

.3 Guying assembly including clamps, collar, guying wire, anchors and wire tightener.

.4 Mulch

1.8 REPLACEMENT

.1 During warranty period, remove from site any plant material that has dried or failed to grown satisfactorily as determined by Owner's Representative.

.2 Replace plant material within the next ideal growing period of (April 15 – June 15) or (September 1 – November 15) in accordance with contract drawings and specifications.

.3 Tag replacement plant material with the date of replacement noted for the duration of the remaining or extended warranty period. Contractor to remove tags at warranty completion.

.4 Extend warranty for replacement plant material for a period equal to the original warranty period.

.5 Continue such replacement and warranty until plant material is acceptable.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Water: potable and free of minerals and impurities that would inhibit plant growth.

.2 Anchors / Stakes: Wooden, 50mm x 50mm x 2440mm.

.3 Ties and accessories: Biodegradable Tree Ties (jute webbing, hessian burlap webbing or approved alternative).

.4 Root Bull Burlap: 150 g Hessian burlap.

.5 Tree wrapping material: new, clean, plain burlap strips minimum 2.5 kg/m^2 mass and 150 mm wide during winter months only on deciduous maple, cherry and birch varieties.

.6 Tree Guard: Arborguard + rodent guard or approved equal to be installed on all deciduous trees.

.7 Mulch:

.1 Mulch trees and shrubs individually, not in continuous beds, providing open space between plants for hydroseeding and erosion control matting.

.2 Bark Chip Mulch: chips from bark of local coniferous trees varying in size from 25 to 50 mm diameter. Natural Colouring.

.3 Composted Wood Chip Mulch: chips, free of bark, small branches, leaves and varying in size from 50 to 75 mm and 5 mm to 20 mm thick. Composted minimum one full season. Natural Colouring, local source.

.8 Wound dressing: horticulturally accepted non-toxic, non-hardening emulsion.

2.2 PLANT MATERIAL

.1 Quality and source: comply with Guide Specifications for Nursery Stock, referring to size and development of plant material and root ball. Measure plants when branches are in their natural position. Height and spread dimensions refer to main body of plant and not from branch tip to branch tip. Use trees and shrubs of No 1 grade.

.2 Additional plant material qualifications:

.1 Plant material obtained from areas with milder climatic conditions from those of site acceptable only when moved to site prior to the braking of buds in their original location, and heeded-in, in a protected area until conditions suitable for planting.

.2 Use trees and shrubs with strong fibrous root system free from disease, insects, defects or injuries and structurally sound. Use trees with straight trunks, well and characteristically branched for species. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site.

.3 Large trees must have been half root pruned during each of two successive growing seasons. The latter at least one growing season prior to arrival on site.

.4 Plant material that has come out of dormant stage and is too far advanced will not be accepted unless prior approval obtained.

.3 Cold storage: pre-approval required for plant material which has been held in cold storage.

.4 Container - Grown Stock: acceptable if containers large enough for root development. Trees and shrubs must have grown in container for minimum of one growing season but not longer than two. Root system must be able to “hold” soil when removed from container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.

.5 Balled and Burlapped: coniferous and broad-leafed evergreens over 500 mm tall must be dug with soil ball. Deciduous trees in excess of 3 m in height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light, sandy or rocky soil. Secure root balls with burlap, heavy twine or rope. For large trees, wrap ball in double layer of burlap

and drum lace with minimum 10 mm diameter rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.

.6 Frozen Ball for Large Trees: dig root ball in fall when soil conditions permit good ball formation. Mulch root ball to prevent intermittent freezing.

.7 Tree Spade Dug Material: dig plant material with mechanized digging equipment of hydraulic space or clam-shell type. Root balls to satisfy CNLA standards. Lift root ball from hole, place in wire basket designed for purpose and line with burlap. Replace root ball and tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.

.8 Collected or transplanted native plant material will not be accepted.

.9 Substitutions to plant material as indicated on planting plan not permitted unless specified material is regionally unavailable and written approval has been obtained as to type, variety and size.

PART 3 EXECUTION

3.1 PRE-PLANTING OPERATIONS

.1 Ensure plant material is acceptable to Owner's Representative.

.2 Remove damaged roots and branches from plant material

.3 Stake out locations of trees and planting beds as per planting plan. Obtain approval prior to excavating.

.4 Coordinate operations. Keep site clean and planting holes drained. Immediately remove soil and debris spilled onto pavement.

3.2 PLANTING TIME

.1 Plant deciduous plant material during dormant period before buds have broken. Plant material noted for spring planting only, must be planted in dormant period.

.2 Plant material imported from region with warmer climatic conditions may only be planted in early spring.

.3 When permission has been obtained to plant deciduous plant material after buds have broken, spray plant with anti-desiccant to slow down transpiration prior to transplanting.

.4 Plant evergreens in spring before bud break. Planting of such stock with root balls may start after middle of August. Apply anti-desiccant to evergreen before digging.

.5 When permission has been obtained, trees, shrubs and ground covers growing in containers may be planted throughout growing season.

.6 Plant only under conditions that are conducive to health and physical conditions of plants.

.7 Provide planting schedule. Extending planting operations over long period using limited crew will not be accepted.

3.3 EXCAVATION

.1 Shrub planting naturalized areas: provide minimum depth of 600mm topsoil in accordance with Section 32 22 19..

.2 Each tree pit to be excavated to a minimum dimension of 900mm depth, with subsoil 'bulb' rising up to support tree ball, to a minimum diameter of 1500mm. Backfill with topsoil in accordance with Section 32 22 19.

.3 Excavate to depth and width as indicated on contract landscape drawings.

.4 Provide drainage for planting holes in heavy soil if natural drainage does not exist. Have method approved.

.5 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil. Dispose of excess material.

.6 Protect bottom of excavations against freezing.

.7 Remove water which enters excavations prior to planting. Ensure source of water is not ground water.

3.4 PLANTING

.1 Loosen bottom of planting hole to depth of 150 mm to 200 mm. Cover bottom of each excavation with minimum of 150 mm of topsoil mixture.

.2 Plant trees and shrubs vertically with roots placed straight out in hole. Orient plant material to give best appearance in relation to trails and seating areas.

.3 Place plant material to depth equal to depth they were originally growing in nursery, with top of root flare set 50mm above surrounding finished grade, left exposed to the air, free from mulch or topsoil.

.4 With balled and burlapped root balls, loosen burlap and cut away minimum top 1.3 without disturbing root ball. With container stock, remove entire container without disturbing root ball. Non bio-degradable wrappings must be removed.

.5 Tree spade Excavated Material:

.1 Dig tree pit with same mechanical equipment as used to dig plant material. Ensure hole dug is as upright as possible. Place in hole a mixture of 40 L of planting soil and fertilizer mixed with water to soupy consistency. This will be forced up side of ball as root ball is placed in hole.

.2 In heavy clay soil dig planting pit as specified for excavation of large trees. Pit Preparation: Loosen bottom of planting hole to depth of 150 to 200 mm. Cover bottom of each excavation with minimum 150 mm topsoil mixture.

.6 During planting of bare-rooted stock, first shake backfill of planting soil among the roots.

.7 Tamp planting soil around root system in layers of 150 mm eliminating air voids. Frozen or saturated planting soil us unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling.

.8 Build 100 mm deep saucer around outer edge of hole to assist with maintenance watering.

.9 When planting is completed, give surface of planting saucer dressing or organic 10-6-4 fertilizer at rate of 12 kg/100m^2 for shrub beds, or 40 to 50g/mm of caliper for trees. Mix fertilizer thoroughly with top layer of planting soil and water in well.

3.5 TREE SUPPORT

.1 Stake trees in accordance with details included on contract landscape drawing set.

3.6 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees as indicated.

.2 Install trunk protection prior to installation of tree supports when used.

3.7 PRUNING

.1 Prune trees and shrubs after planting as indicated to compensate for loss of roots suffered during transplanting. Postpone pruning of those trees where heavy bleeding may occur, until in full leaf. Employ clean sharp tools and make cuts flush with main branch. Smooth and sloping as to prevent accumulation of water. 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 and shrubs without changing their natural shape. Do not damage lead branches or remove smaller twigs along main branches. Treat cuts in excess of 20 mm dia. and damaged parts with application of wound dressing.

3.8 MULCHING

.1 Obtain approval of planting before mulching material is applied. Loosen soil in planting beds and pits and remove debris and weeds. Spread mulch to minimum thickness of

50 mm. Mulch material susceptible to blowing must be moistened and mixed with topsoil before applying. When mulching is placed in fall, place immediately after planting. When mulching is placed in spring, wait until soil has warmed up. Keep mulch 150mm clear from base of tree stem, leaving top of root flare exposed to air.

3.9 MAINTENANCE

.1 Remove all identifying tags, ties and non-natural materials from all plant material following installation.

.2 Water once a week for first four (4) weeks and then sufficiently thereafter to maintain optimum growing conditions. Ensure adequate moisture in root zone at freeze-up.

.3 Keep soil within confines of planting saucer around trees and planting beds, shallowly cultivated and free from weeds.

.4 Keep tree guards and staking in proper repair.

.5 Provide adequate protection against winter damage, including damage caused by rodents, sun-scalding and splitting.

.6 Maintain plant material from date of planting up to end of warranty period.

.7 Remove any trunk wrapping, tree stakes, winter protection and staking at end of warranty period.

END OF SECTION

Schedule D