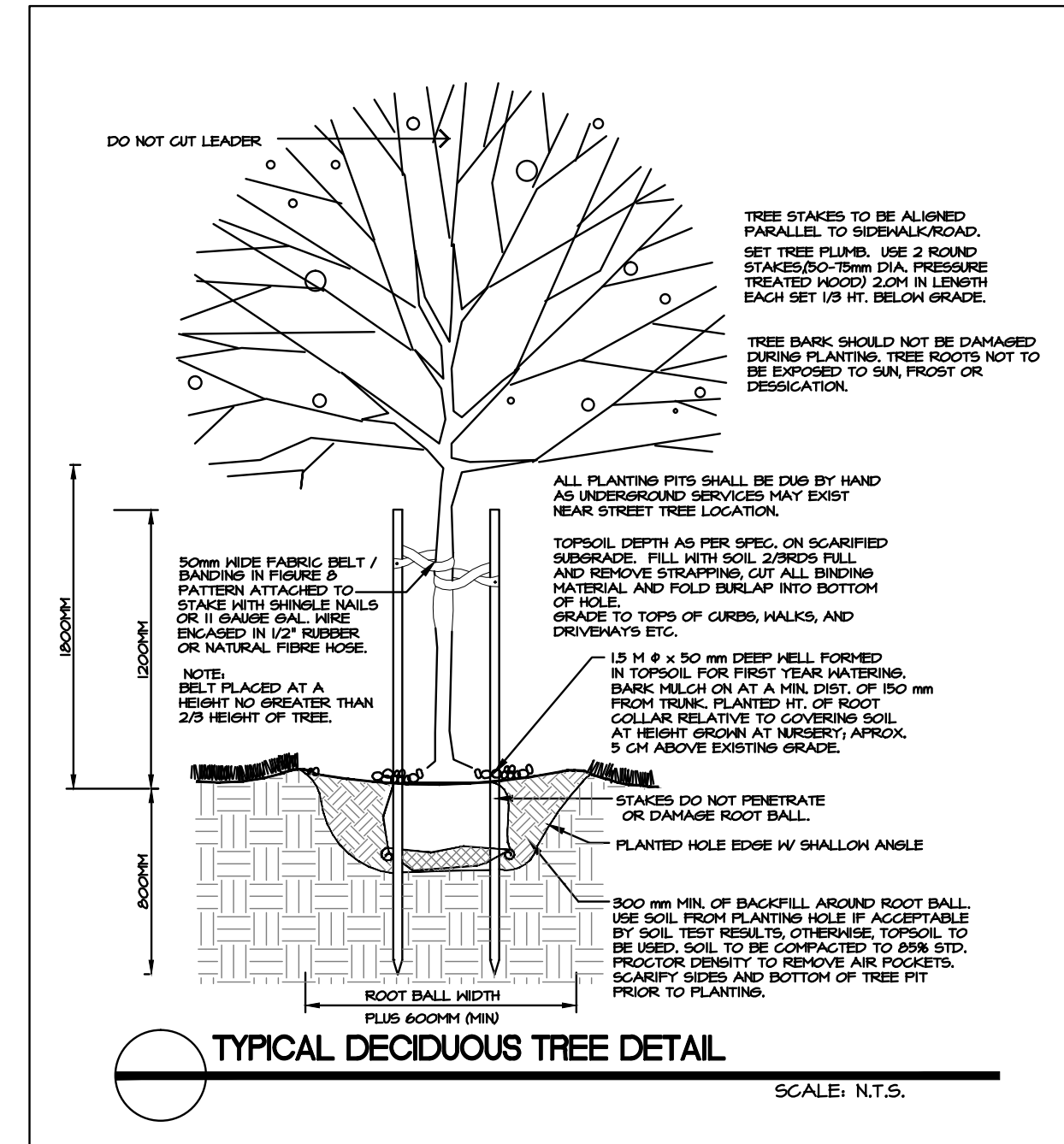
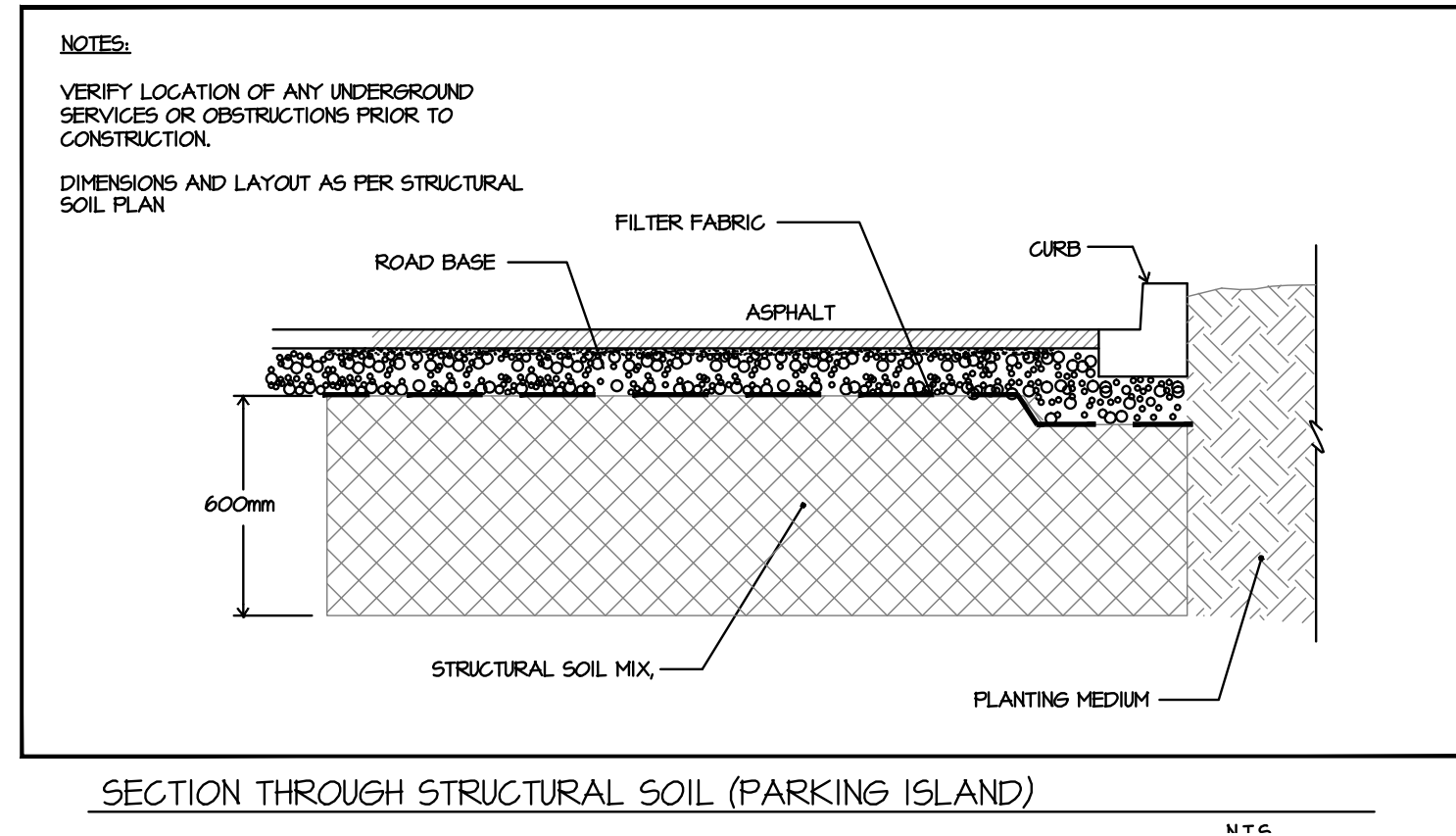


PLANT SCHEDULE

KEY	QTY	BOTANICAL NAME	COMMON NAME	M2 JOB NUMBER: D11-071	PLANTED SIZE / REMARKS
TREE	2	QUERCUS RUBRA	RED OAK		6CM GAL; 1.8M STD; B4B
SHRUB	6	STYRAX JAPONICUS	JAPANESE SNOWBELL		6CM GAL; 1.8M STD; B4B
NI	100	NANDINA DOMESTICA	HEAVENLY BAMBOO		#3 POT
X	108	ABELIA EDWARD GOUGHER	PINK ABELIA		#3 POT; 50CM
P	4	PIERIS JAPONICA	PIERIS		#3 POT; 50CM
GRASS	6	PENNISETUM ALOPECUROIDES 'LITTLE BUNNY'	LITTLE BUNNY FOUNTAIN GRASS		#1 POT
GC	164	COTONEASTER DAMMERII	BEARBERRY COTONEASTER		SP4
E	98	EUONYMUS JAPONICA 'EMERALD GAIETY'	EUONYMUS SILVER VARIEGATED		#1 POT; 25CM

NOTES: * PLANT SIZES IN THIS LIST ARE SPECIFIED ACCORDING TO THE BC LANDSCAPE STANDARD, LATEST EDITION. CONTAINER SIZES SPECIFIED AS PER CANTA STANDARDS. BOTH PLANT SIZE AND CONTAINER SIZE ARE THE MINIMUM ACCEPTABLE SIZES. * REFER TO SPECIFICATIONS FOR DEFINED CONTAINER MEASUREMENTS AND OTHER PLANT MATERIAL REQUIREMENTS. * SEARCH AND REVIEW MAKE PLANT MATERIAL AVAILABLE FOR OPTIONAL REVIEW BY LANDSCAPE ARCHITECT AT SOURCE OF SUPPLY. AREA OF SEARCH TO INCLUDE LOWER MAINLAND AND FRASER VALLEY. * SUBSTITUTIONS: OBTAIN WRITTEN APPROVAL FROM THE LANDSCAPE ARCHITECT PRIOR TO MAKING ANY SUBSTITUTIONS TO THE SPECIFIED MATERIAL. UNAPPROVED SUBSTITUTIONS WILL BE REJECTED. ALLOW A MINIMUM OF FIVE DAYS PRIOR TO DELIVERY FOR REQUEST TO SUBSTITUTE. SUBSTITUTIONS ARE SUBJECT TO BC LANDSCAPE STANDARD - DEFINITION OF CONDITIONS OF AVAILABILITY.

ALL PLANT MATERIAL MUST BE PROVIDED FROM CERTIFIED DISEASE FREE NURSERY. PROVIDE CERTIFICATION UPON REQUEST.



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1811 Falcon Drive
Coquitlam, British Columbia
V3E 2C2
Tel: 604.941.6258
Fax: 604.434.3088

NO.	DATE	REVISION DESCRIPTION	DR.
5	12MAR20	REV. PER NEW SITE PLAN	MTLM
4	11JAN21	REVISE PER NEW SITE PLAN	MTLM
3	11MAY20	REV. PER ADP COMMENTS	MTLM
2	11MAY21	REV. PER CITY COMMENTS	MTLM
1	11APR18	ISSUE FOR DP	MTLM

SEAL:
PROJECT: **BUILDING G
TERMINAL PARK
1451 ESTEVAN ROAD
NANAIMO, B.C.**

DRAWING TITLE: **LANDSCAPE PLAN**

DATE: 11APR15	DRAWING NUMBER:
SCALE: 1/16"=1'-0"	L1
DRAWN: MTLM	
DESIGN: MTLM	
CHKD:	OF 3
M2LA PROJECT NUMBER: 11-071	

PART ONE - GENERAL

- 11 COPYRIGHT**
- 1 The Structural Soil specification is provided as an instrument of service and remains the property of M2 Landscape Architecture. The information provided in this specification is for exclusive use by our client for the specific project noted. This information contained in this document may not be reproduced or distributed, in whole or in part, without the permission of M2 Landscape Architecture.
- 12 SCOPE OF WORK**
- 1 The work of this section shall govern the supply of all equipment, materials and labour necessary for the preparing and placing and compacting Structural Soil Mix on a prepared sub grade.
 - 2 It is the intent that the structural soil mixture will provide the necessary load bearing characteristics for light load hard surface paving areas while allowing and promoting the development of tree roots. The long term goals the promotion of healthy, long lived trees while reducing the potential negative implications of large scale root development under hard surface areas.
 - 3 Refer to drawings for location and dimension of structural soil mixture.
 - 4 All other related work as described in the drawings and/or this specification.
- 13 RELATED WORK**
- 1 Section 02100, Landscape Requirements
 - 2 Section 02710, Landscape Drainage
 - 3 Section 02810, Irrigation System
 - 4 Section 02933, Sodding (Seeding)
 - 5 Section 02906, Planting Trees, Shrubs, and Groundcover
- 14 RELATED MASTER MUNICIPAL SPECIFICATIONS**
- 1 Contractor to report all conflicts with civil engineering to Landscape Architect
 - 2 Section 02210, Site Grading
 - 3 Section 02223, Excavating, Trenching, and Backfilling
 - 4 Section 02226, Aggregates and Granular Materials
 - 5 Section 02666, Waterworks
 - 6 Section 02721, Storm Sewers
 - 7 Section 02725, Manholes and Catch Basins
- 15 STANDARDS**
- 1 BCSLA/BCLNA Landscape Standard (most current edition)
 - 2 Canadian System of Soil Classification
- 16 QUALITY ASSURANCE**
- 1 All structural soil material used in street tree planting shall be from a source approved by the Consultant and all similar materials supplied to the site shall be of similar nature and from a single source. 14 days prior to supplying any material to the site, inform the Consultant of proposed source and provide a copy of an analysis undertaken by a recognized testing agency approved by the owner, at the Contractor's expense and indicating the particle size characteristics of the proposed material in written form as laid out in 2.1.1 of this section.
 - 2 All nutritive admixtures to structural soil material supplied to the site shall be from a source approved by the Consultant and all similar nutritive admixtures supplied to the site shall be of similar nature and from a single source. 14 days prior to supplying any nutritive admixture, inform the Consultant of proposed source and provide a copy of an analysis undertaken by a recognized testing agency approved by the owner. The test report shall quantify and qualify the following characteristics of the proposed nutritive admixture:
 - 2.1 Gravel, sand and fines content each as a % of dry weight mineral
 - 2.2 Organic material content as a percentage of dry weight.
 - 2.3 Acidity (pH)
 - 2.4 Salinity in millimhos/cm at 25 degrees C.
 - 2.5 Basic fertility (total nitrogen available K, Ca, Mg, P)
 - 2.6 Recommendation for incorporation of necessary amendments.
 - 3 Provide and pay for all required testing of materials proposed for use on this project. At the Consultant's discretion, all materials may be re-tested. Contractor will be responsible for costs of re-testing if materials do not meet specification and for correction of the deficiency.
 - 4 Cost of imported materials shall include cost of modifications from source to ensure that these materials meet specifications.
 - 5 Acceptance of material at source does not preclude future rejection if material fails to conform to requirements specified.
 - 6 Confirm compaction of subgrade and structural soil by Geotechnical Report's from qualified Geotechnical Engineer.
 - 7 Aggregate Test:
 - 7.1 Provide source and sieve designation of intended aggregate material prior to ordering.
 - 7.2 At the Landscape Architect's discretion, materials may be retested. Contractor is responsible for costs of testing if sample does meet specification and for correction of any deficiency.
 - 7.3 Submit 2.5kg sample of stone to Landscape Architect prior to mixing. Sample should be labelled to include source of material submitted.
 - 8 Structural Soil Mix Design:
 - 8.1 Prepare sample of structural soil mix with proposed mix ratios for approval by Landscape Architect a minimum of 14 days prior to placement. Notify Landscape Architect minimum 2 days prior to mixing samples.
 - 8.2 Landscape Architects may request additional samples of Structural Soil mixture to be tested in the event that further refinement of the mixture is necessary.
- 17 SCHEDULING**
- 1 Obtain approval from Consultant of schedule 14 days in advance of structural soil preparation or delivery of material to site. Co-ordination of the installation of the structural soil mixture is critical. Ensure scheduling has been co-ordinated with all consultants and related contractors.
 - 2 Schedule to include:
 - 2.1 date for commencement of preparation of structural soil at source
 - 2.2 sub grade preparation at site
 - 2.3 shipping dates
 - 2.4 arrival dates on site
 - 2.5 installation dates
 - 3 Schedule work to co-ordinate with installation of any drainage, irrigation, tree grate footings, lighting, paving etc.
 - 4 Complete work to ensure tree planting will occur under optimum conditions
 - 5 Do not handle or place structural soil mix in rain.
- 18 FIELD REVIEW**
- 1 Start up meeting with Consultant is required to confirm the areas of installation and mixing. If not previously submitted, ensure growing medium sample and test report, aggregate stone sample and structural soil sample and report are supplied at the Start-up Meeting.
 - 2 Co-ordinate site meeting with Consultant at the following times:
 - 2.1 drainage installation and connection
 - 2.2 irrigation installation
 - 2.3 mixing of structural soil mixture
 - 2.4 installation of structural soil mixture
 - 2.5 sub grade preparation and layout.
 - 2.6 installation of trees
 - 3 Where materials are installed in phases, it is the contractor's responsibility to inform the Consultant of critical installation times for each phase as noted in Section 1.8.2.
- 19 SAMPLES**
- 1 Provide 2 kg samples of all materials required for the preparation of structural soil minimum 14 days prior to commencement of installation. Samples of all material shall be submitted with test report from approved testing agency as per section 1.3.2 and 1.3.3
- 110 PRODUCT HANDLING**
- 1 All materials used in the composition of structural soil shall not be prepared, worked or traveled upon when in a wet or frozen condition.
 - 2 Supply and handle dolomite lime, fertilizer, stabilizer and other chemical amendments in standard, sealed, waterproof containers with net weight and product analysis clearly marked on exterior of package.
- 111 DELIVERY, STORAGE AND PROTECTION**
- 1 For structural soil prepared at source and delivered to site, deliver all materials to site in such a manner as to prevent damage to or separation of all materials used in the preparation of structural soil.
 - 2 On-site storage of prepared structural soil shall be undertaken in such a manner as to prevent damage or separation of any materials.
 - 3 Structural soils to be installed as soon as practicable after mixing, any structural soils stored overnight whether on-site or at source shall be covered with tarpaulin of material approved by the Consultant until such time as materials installed.
 - 4 All material to be stockpiled shall be protected in accordance with B. C. Ministry of Environment guidelines.

PART TWO - PRODUCTS

- 21 GROWING MEDIUM**
- 1 TABLE ONE:
 - 1.1 Provide all growing medium required to complete the work.
 - 1.2 Comply with the requirements of Table 1, below
 - 1.3 Organic material in the growing medium must be well decomposed to prevent oxygen consumption caused as a result of decomposition of the organic matter in the soil mixture.
- | PROPERTIES | GROWING MEDIUM FOR GAP-GRADED MIXTURE |
|--|---------------------------------------|
| TEXTURE: Particle size classes by the Canadian System of Soil Classification | |
| Gravel: greater than 2mm - less than 75mm | 0 |
| Sand: greater than 0.075mm - less than 2mm | maximum 60% |
| Silt: greater than 0.002 mm - less than 0.05 mm | maximum 35% |
| Clay: less than 0.002mm | maximum 15% |
| Clay and Silt Combined | maximum 40% |
| ACIDITY (pH): | 6.0 - 7.0 |
| DRAINAGE: Minimum saturated hydraulic conductivity (cm/hr) in place. | 3.0 |
| SALINITY: Saturated extract conductivity shall not exceed: | 3.0 millimhos/cm at 25°C |
| ORGANIC CONTENT: Percent of Dry Weight (%) | 8% - 12% |
- 22 AGGREGATE**
- 1 Clean inert stone of high angularity is preferred over washed gravel.
 - 2 Stone dimension aspect ratio should approach 1:1 with a maximum of 2:1 length: width: depth.
 - 3 Single size stone, 75mm clear sieve designation: Blasted Quarry Rock.
 - 4 Aggregate to be used for structural soil shall be free of any foreign elements or material. Provide samples and test reports as described in section 15 and 1.8
 - 5 Aggregate quality: Material shall be sound hard, durable, free from soft, thin, elongated or laminated particles, organic material, clay lumps or material, or other substances that would act in a deleterious manner or use intended.
- 23 SOIL STABILIZER**
- 1 A non-toxic organic binder.
Product: Stabilizer, The Original Natural Binder, as available from Island Sport Turf, Parksville, BC. 250-616-1199. Also available from Yardworks Supply Ltd., Aldergrove, BC. 604-607-3004.
- 24 GRANULAR BASE**
- 1 To Master Municipal Specification Section 02226, Aggregates and Granular Materials.
- 25 PAVING MATERIALS**
- 1 Refer to architectural drawings.
- 26 FILTER FABRIC**
- 1 Non Woven filter fabric shall be installed as a separation layer directly above the compacted structural soil mixture. Do not install fabric until adequate compaction of the structural soil mixture has been confirmed.
 - 2 Filter fabric shall be selected and designed to withstand wear and tear during construction without deterioration of its strength and filtering properties. Conform to the following ASTM designations:
 - Grab Tensile Strength ASTM-D-4632 4000 lN
 - Tensile Elongation ASTM-D-4432 50%
 - Mullen Burst ASTM-D-3786 1270 kPa
 - Flow Rate ASTM-D-4491 610 l/min/m²
 - 3 Fabric shall be Amoco 4545 or approved equivalent.

PART THREE - EXECUTION

- 31 SUBGRADE**
- 1 Excavate sub grade to establish tree pit / trench as indicated on contract drawings. Place the structural soil under the paving adjacent to the planting pits, NOT in the planting pits themselves.
 - 2 Areas designated as structural soil tree pits for street tree planting shall be prepared to ninety-five percent (95%) Modified Proctor Density and shall be free of stones, debris, root branches, toxic materials, building materials and other deleterious materials to the approval of the civil engineer.
- 32 PREPARATION OF EXISTING GRADE**
- 1 Verify that grades are correct. If discrepancies occur, notify Consultant and do not commence work until directed.
 - 2 Excavate Trench to Master Municipal Specification Section 02223, Trenching, Excavation and Compaction allowing for design depth and width of structural soil mix.
 - 2.1 Refer to contract drawings for areas to be treated and to details for dimensions
 - 2.2 Compact to 95% Modified Proctor Density.
 - 2.3 Subgrade elevations shall slope parallel to the finished grades and/or toward the subsurface drain lines as indicated on the civil engineering drawings.
 - 4 Do not proceed with the installation of the structural soil material until all walls, curbs, and utility work in the area has been installed. Structural elements or design features that are dependent on the structural soil mixture for support may be postponed until after the installation of the mixture.
 - 5 Re-compact disturbed subgrade to requirements of master municipal specifications and civil engineering drawings.
- 33 SUB DRAINS**
- 1 Install to requirements of Master Municipal Specifications. Refer to Section 02666, Waterworks, Section 02721, Storm Sewers, and Section 02725, Manholes and Catch Basins
 - 1.1 Install prior to installation of the structural soil mixture.
 - 1.2 Co-ordinate all contract drainage work with other drainage on-site
 - 1.3 Confirm location of storm sewer connections with civil engineer.
- 34 IRRIGATION**
- 1 Install to requirements of Section 02810, Irrigation System. Refer also to Irrigation Drawings.
 - 1.1 Install irrigation main lines in co-ordination with installation of the structural soil. Confirm timing at start-up meeting.
 - 1.2 Co-ordinate all contract irrigation work with other civil engineering and drainage on-site
 - 1.3 Confirm location of irrigation connections with civil engineer.
- 35 MIXING STRUCTURAL SOIL MATERIAL**
- 1 Ensure consistent even distribution of all components by thorough mixing. The ratio of components will vary and may require adjustment to ensure the soil volume is adequate to fill all voids in the stone.
 - 2 Base Ratio of Materials:
 - 4 cu metre of aggregate stone section 2.2
 - 125 cu metre of Growing Medium section 2.1
 - 2 kg Stabiliser section 2.3
 - × Water as required
 - × The amount of water required will vary according to moisture present in growing medium.
 - 3 Combine the stone, growing medium and Stabilizer product into a thorough, homogeneous mixture. Moisten mixture with fine spray of clean potable water while mixing to activate Stabilizer product.
- 36 MIXING**
- 1 Do not OVER MIX, OVER HANDLING can result in separation of the growing medium from the stone. Further and final mixing will occur during the placement of the material.
 - 2 All mixing shall be performed on a flat hard, level surface approved by the consultant, using the appropriate soil mixing equipment.
 - 3 Prepare sample Structural Soil Mixes to determine ratio of mix components. Submit sample with test results for approval.

PART THREE - EXECUTION (cont)

- 36 MIXING**
- 1 Do not OVER MIX, OVER HANDLING can result in separation of the growing medium from the stone. Further and final mixing will occur during the placement of the material.
 - 2 All mixing shall be performed on a flat hard, level surface approved by the consultant, using the appropriate soil mixing equipment.
 - 3 Prepare sample Structural Soil Mixes to determine ratio of mix components. Submit sample with test results for approval.
- 37 PLACEMENT**
- 1 Subgrade shall be approved by the Consultant prior to placement of the structural soil mixture.
 - 2 Structural soil shall be moist, but not saturated with water when placed. Placement shall be handled to avoid damage to drainage structures, irrigation equipment, concrete structure or pavement.
 - 3 Place Stone mixture in 300mm lifts through entire area of structural soil mixture.
 - 4 Compact each lift of structural soil material with vibrating drum roller to the satisfaction of the civil engineer.
 - 5 Provide Geotechnical Report to confirm compaction. Test to ensure uniform, acceptable compaction rates have been achieved for each lift and in all areas of structural soil mixture. Refer to Quality Assurance, section 1.5
 - 6 Provide a uniformly firm and level surface allowing for specified depths of road base and / or growing medium to meet finished design grade.
 - 7 Installation of structural soil in the location of the tree is not recommended. Various techniques such as reinforced wood boxes, steel boxes, large diameter PVC pipe, etc. have been employed to allow for sand to be installed at the tree location with the compacted structural soil surrounding the hole. At the time of tree installation, the sand is removed and growing medium (as per Section 2.1) added to surround the root ball.
- 38 INSTALLATION OF FILTER FABRIC**
- 1 After approval of structural soil mixture compaction, install Filter Fabric.
 - 2 Ensure minimum 60cm overlap of all fabric seams and beyond edge of structural soil.
- 39 GRANULAR BASE MATERIAL**
- 1 Place minimum 75 mm granular base on top of filter fabric over structural soil layer.
 - 2 Compact granular base to 95% Modified Proctor Density. Compaction must be consistent with other surrounding granular base materials.
 - 3 All areas shall be graded to the contours and elevations indicated on the contract drawings. Ensure positive drainage.
- 310 PROTECTION**
- 1 Protect existing conditions from damage or staining and make good any damage.
 - 2 All damage will be repaired at the expense of the installation contractor.
- 311 TREE PLANTING**
- 1 Remove structural soil or other backfill material (sand, see comments in section 3.1.7) from the full dimensions of the tree grate area (1.2m x 1.2m x depth of root ball).
 - 2 Re compact all material below root ball to original specified density to prevent settling of the root ball in the hole.
 - 3 Ensure tree is planted in the exact centre of the specified planting station straight and true.
 - 4 Install tree in accordance with BCSLA Landscape Standard. Cut away synthetic root ball twine, cut back improperly sized wire baskets, pull back burlap from around trunk etc.
 - 5 Backfill with Growing Medium as per Section 2.1. Ensure the same growing medium used in the structural soil mix is installed as backfill material.
 - 6 Place 50mm depth composted fir/hem bark mulch over the top of the open tree pit area.
- 312 TREE GRATES**
- 1 Site Furniture and to contract drawings for tree grates, frames and footings.
- 313 ACCEPTANCE**
- 1 Consultant shall inspect structural soil "in place" and determine acceptance of material, and finish grading prior to paving.
 - 2 Finish grade shall be to within 15mm of proposed grades within 3.0m of any adjacent fixed elevation and to within 15mm of proposed grades over any other 3.0 length. Finish grades shall not be uniformly high or low.
- 314 SURPLUS MATERIAL**
- 1 Remove all excess fill soils and mix stock piles and dispose of all waste materials, trash and debris from the site.
 - 2 Clean up any soil or dirt spilled on any paved surface at the end of each working day.
 - 3 Upon completion of the structural soil mixture installation. Leave area broom-clean. Avoid washing the area until all of the paving has been completed.

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1811 Falcon Drive
Coquitlam, British Columbia
V3E 2C2
Tel: 604.941.6258
Fax: 604.434.3088

1 11 APR 10 ISSUE FOR DP MTLM

5	12 MAR 20	REV. PER NEW SITE PLAN	MTLM
4	11 JAN 21	REVISE PER NEW SITE PLAN	MTLM
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NO.	DATE	REVISION DESCRIPTION	DR.
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SEAL:

PROJECT:
**BUILDING G
TERMINAL PARK**
**1451 ESTEVAN ROAD
NANAIMO, B.C.**

DRAWING TITLE:
**STRUCTURAL SOIL
SPECIFICATION**

DATE: 11 MAY 10	DRAWING NUMBER:
SCALE: -	L3
DRAWN: MTLM	
DESIGN: MTLM	
CHKD:	