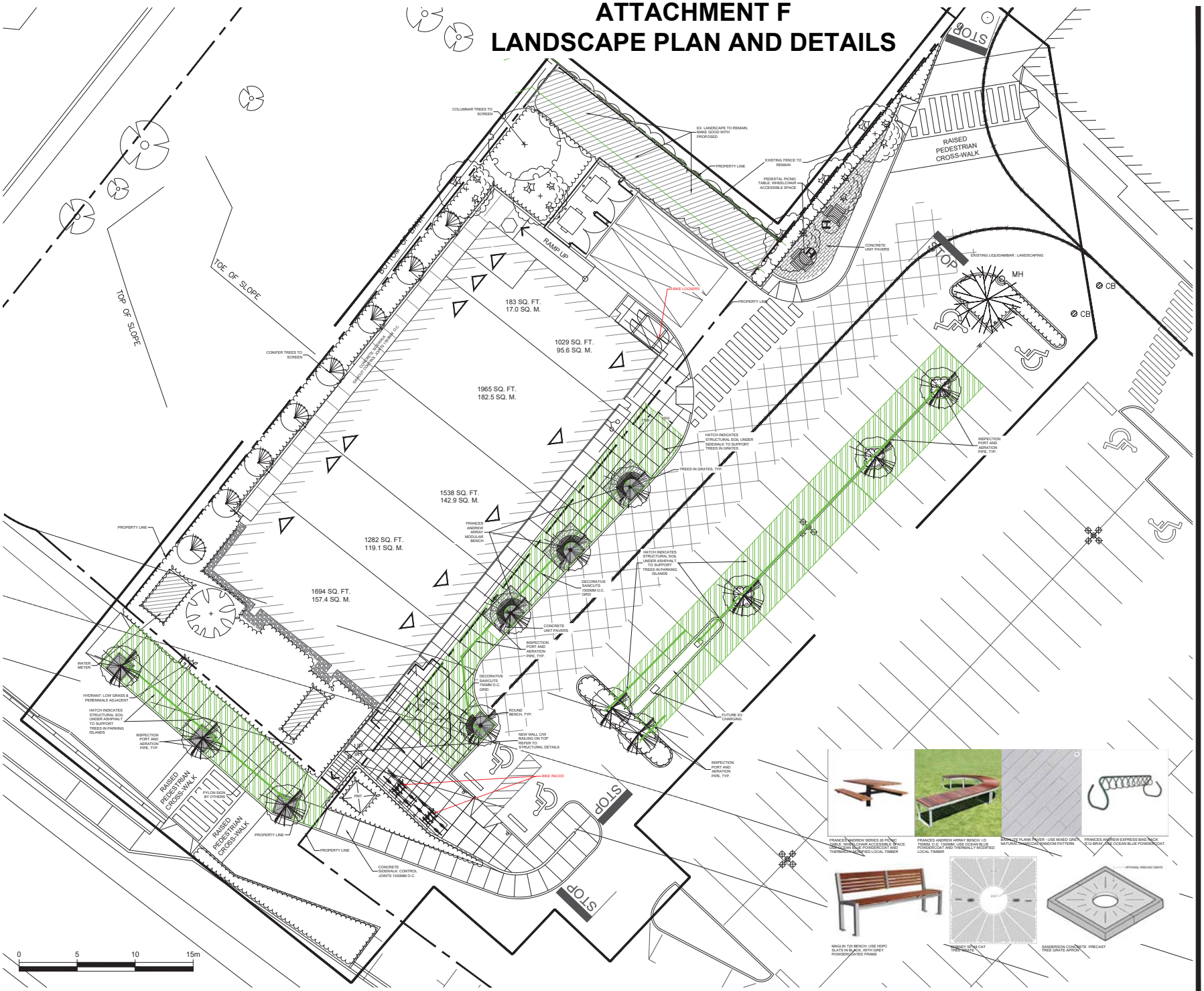
ATTACHMENT F
LANDSCAPE PLAN AND DETAILS



FRANCES ANDREW SERIES 26 PICNIC TABLE: WHEELCHAIR ACCESSIBLE SPACE. 1500 OCEAN BLUE POWDERCOAT AND THERMALLY MODIFIED LOCAL TIMBER

FRANCES ANDREW ARRAY BENCH: I.D 750MM, O.D. 1360MM, USE OCEAN BLUE POWDERCOAT AND THERMALLY MODIFIED LOCAL TIMBER

DECORATIVE PLANK PAVER - USE MIXED GREY NATURAL CHARCOAL RANDOM PATTERN

FRANCES ANDREW EXPRESS BIKE RACK 2-U-BRSH_USE OCEAN BLUE POWDERCOAT.

MAGLIN 720 BENCH: USE HDPC SLATS IN BLACK, WITH GREY POWDERCOATED FRAME

SIDNEY SPIKE CAT TREE GRATE

SANDERSON CONCRETE PRECAST TREE GRATE APRON

pmg LANDSCAPE ARCHITECTS
Suite C100 - 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 ; f: 604 294-0022

SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
6	23.JAN.23	UPDATE PER CITY COMMENTS	CLG
5	22.DEC.16	ADP COMMENTS & ISSUE FOR SUBMISSION	CLG
4	22.OCT.24	ADD PROPERTY LINE TAGS	CLG
3	22.OCT.07	ISSUED FOR PERMIT	CLG
2	22.SEP.22	ISSUE FOR DP	CLG
1	22.SEP.15	UPDATE PER NEW SITE PLAN / 95% DRAWINGS	CLG

CLIENT:

PROJECT:
COMMERCIAL DEVEOPMENT

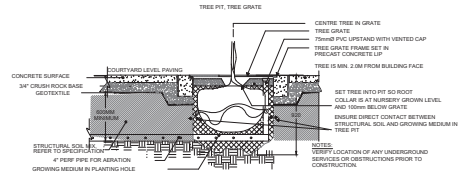
AT BROOKS LANDING
2180 HIGHLAND BLVD.
NANAIMO, B.C.

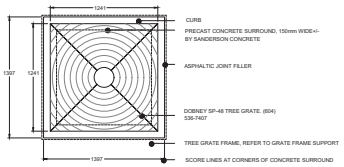
DRAWING TITLE:
LANDSCAPE PLAN

DATE:	22.AUG.23	DRAWING NUMBER:
SCALE:	1:100	**L1**
DRAWN:	MM	
DESIGN:	MM	
CHK'D:	MCY	**OF 4**

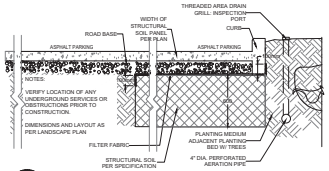
PMG PROJECT NUMBER: **22-176**

22176-5.ZIP

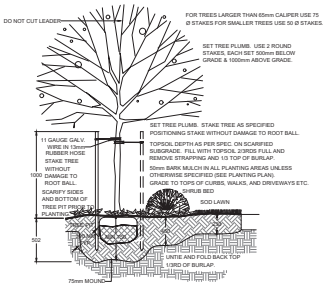




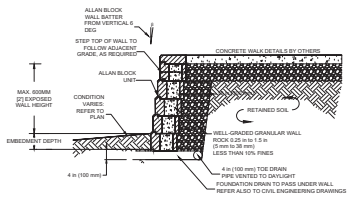
1 TREE IN TREE GRATE WITH STRUCTURAL SOIL
1:20



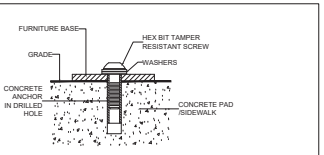
2 STRUCTURAL SOIL IN PARKING AREA
1:20



3 PLANTING DETAILS
1:20

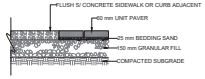


4 GRAVITY BLOCK WALL
1:20

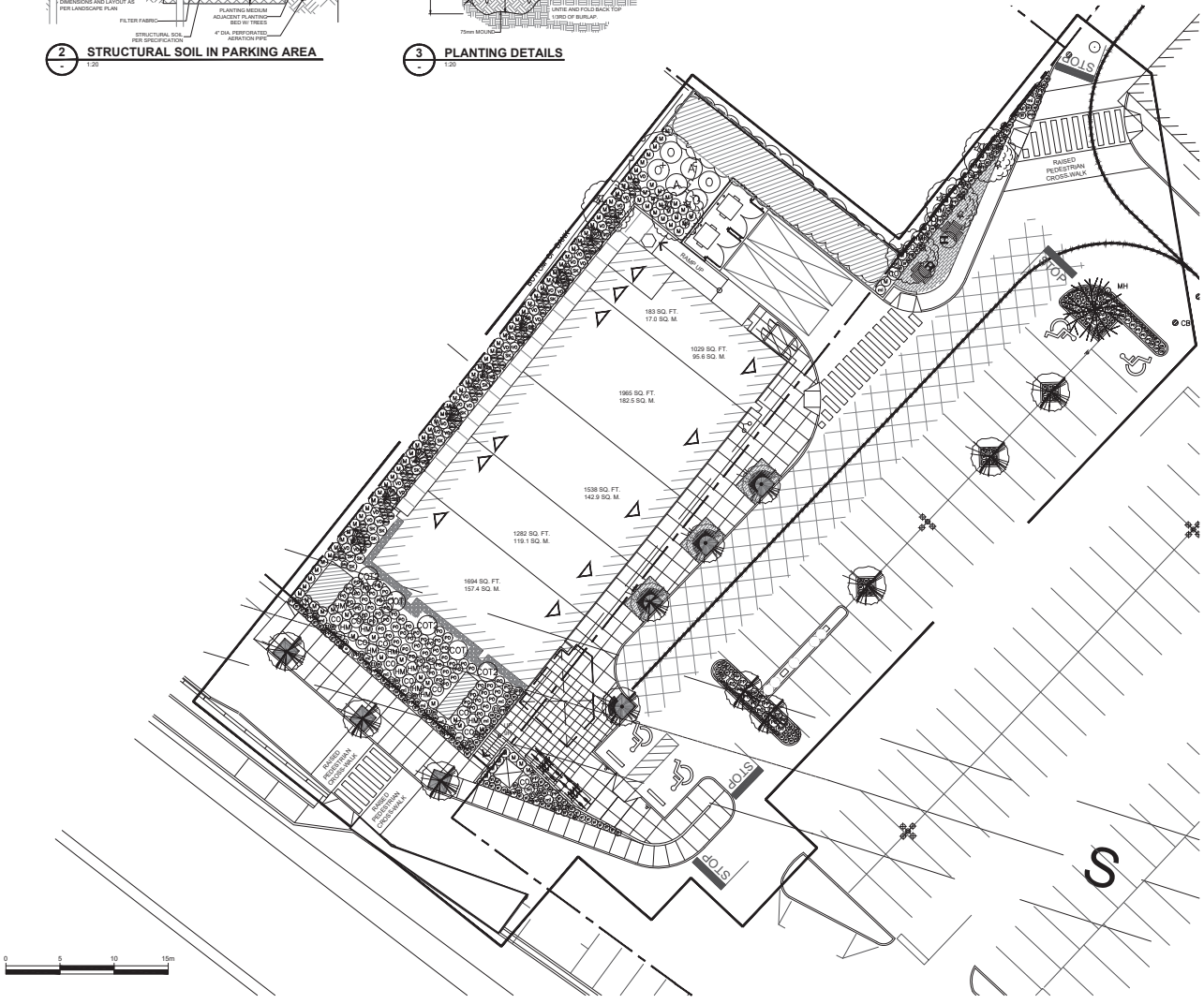


NOTE:
SITE FURNISHINGS TO BE INSTALLED TO MANUFACTURERS SPECIFICATIONS

6 SITE FURNITURE MOUNTING
NO SCALE



7 PAVERS EDGE
1:12



PLANT SCHEDULE

PMG PROJECT NUMBER: 22-176

KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANTED SIZE / REMARKS
TREES				
AM	4	ACER GRISEUM	PAPERBARK MAPLE	6CM CAL; 1.8M STD; B&B; CLIMATE RESILIENT
CC	2	CRATAEGUS CRUS-GALLI 'CRUSADER'	THORNLESS COCKSPUR HAWTHORN	6CM CAL;1.5M STD; B&B; CLIMATE RESILIENT
LS	2	LIQUIDAMBAR STYRACIFLUA 'SLENDER SILHOUETTE'	SLENDER SILHOUETTE SWEETGUM	6CM CAL; 2M STD; B&B; CLIMATE RESILIENT
LW	1	LIQUIDAMBAR STYRACIFLUA 'WORPLESTON'	SWEET GUM	5CM CAL; B&B; CLIMATE RESILIENT
PG	1	PICEA OMORIKA 'BRUNS'	BRUNS SERBIAN SPRUCE	1.5M HT; B&B; CLIMATE RESILIENT
QR	2	QUERCUS ROBUR 'FASTIGIATA'	FASTIGATE ENGLISH OAK	6CM CAL; 1M STD; B&B; CLIMATE RESILIENT
SHRUBS				
AU	2	ARBUTUS UNEDO	STRAWBERRY TREE	#3 POT; 80CM
CK	22	CORNUS SERICEA 'KELSEYI'	KELSEY DOGWOOD	#2 POT; 40CM
CO	2	COTINUS COGGYGRIA	SMOKE BUSH	#3 POT; 80CM
CG	3	COTINUS COGGYGRIA 'GOLDEN SPIRIT'	GOLDEN SMOKE BUSH	#3 POT; 80CM
EM	11	EUONYMUS JAPONICUS 'GREEN SPIRE'	GREEN SPIRE EUONYMUS	#2 POT; 30CM
HL	13	HYDRANGEA MACROPHYLLA 'LIMELIGHT'	LIMELIGHT HYDRANGEA	#3 POT; 80CM
MA	126	MAHONIA AQUIFOLIUM	OREGON GRAPE	#2 POT; 40CM #3 POT; 50CM
NG	7	NANDINA DOMESTICA 'GULF STREAM'	GULF STREAM HEAVENLY BAMBOO	#3 POT
OS	4	OSMANTHUS X BURKWOODII	BURKWOOD OSMANTHUS	#3 POT; 50CM
PL	89	PRUNUS LAUROCERASUS 'OTTO LUYKEN'	OTTO LUYKEN LAUREL	#3 POT; 50CM
SJ	17	SKIMMIA JAPONICA 'MACROPHYLLA'	LARGE LEAF JAPANESE SKIMMIA	#3 POT; 50CM
VO	39	VACCINIUM OVALIFOLIUM	OVAL-LEAF BLUEBERRY	#3 POT; 60CM
GRASSES				
CK	17	MISCANTHUS SINENSIS 'MORNING LIGHT'	MORNING LIGHT JAPANESE SILVERGRASS	#2 POT
PA	42	PENNISETUM ALOPECUROIDES	FOUNTAIN GRASS	#1 POT
SL	154	STIPA TENUISSIMA	MEXICAN FEATHER GRASS	#1 POT
PERENNIALS				
CO	60	COREOPSIS VERTICILLATA 'MOONBEAM'	TICKSEED	15 CM POT
EP	18	ECHINACEA PURPUREA 'SOMBRERO TRES AMIGOS'	SOMBRERO PURPLE CONEFLOWER	15CM POT
SE	7	IBERIS SEMPERVIRENS 'SNOWFLAKE'	SNOWFLAKE EVERGREEN CANDYTUFT	15CM POT
NF	5	NEPETA x FAASSENII 'DROPMORE'	BLUE CATMINT	15CM POT
RF	6	RUDBECKIA FULGIDA VAR SULLIVANTII 'GOLDSTURM'	RUDBECKIA; YELLOW	15CM POT
SA	25	SEDUM CAUTICOLA 'BETRAM ANDERSON'	BETRAM ANDERSON STONECROP	9CM POT
GC				
GS	117	GAULTHERIA SHALLON	SALAL	#1 POT; 20CM; 60CM O.C.

NOTES: * PLANT SIZES IN THIS LIST ARE SPECIFIED ACCORDING TO THE BC LANDSCAPE STANDARD AND CANADIAN LANDSCAPE STANDARD, LATEST EDITION. CONTAINER SIZES SPECIFIED AS PER CNLA STANDARD. 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 AND CANADIAN LANDSCAPE STANDARD - DEFINITION OF CONDITIONS OF AVAILABILITY. * ALL LANDSCAPE MATERIAL AND WORKMANSHIP MUST MEET OR EXCEED BC LANDSCAPE STANDARD AND CANADIAN LANDSCAPE STANDARD LATEST EDITION. * ALL PLANT MATERIAL MUST BE PROVIDED FROM CERTIFIED DISEASE FREE NURSERY. * BID-SOLIDS NOT PERMITTED IN GROWING MEDIUM UNLESS AUTHORIZED BY LANDSCAPE ARCHITECT.

pmg LANDSCAPE ARCHITECTS
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Burnaby, British Columbia, V5C 6G9
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SEAL:

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6	23.JAN.23	UPDATE PER CITY COMMENTS	CLG
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1	22.SEP.15	UPDATE PER NEW SITE PLAN / 95% DRAWINGS	CLG

CLIENT:

PROJECT:
COMMERCIAL DEVEOPMENT

AT BROOKS LANDING
2180 HIGHLAND BLVD.
NANAIMO, B.C.

DRAWING TITLE:
SHRUB PLAN

DATE: 22.AUG.23
SCALE: 1:150
DRAWN: MM
DESIGN: MM
CHK'D: MCY

DRAWING NUMBER: **L2** **OF 4**

PMG PROJECT NUMBER: **22-176**

RECEIVED
DP1286
2023-FEB-02
Current Planning
22176-S.ZIP

PART ONE GENERAL REQUIREMENTS

1.1 REFERENCES

.1 CCDC Doc 2 2008
Comply with all articles in the General Conditions of Contract in conjunction with this section unless superseded by other Contract Documents.

.2 Canadian Landscape Standard, latest edition, prepared by the Canadian Society of Landscape Architects and the Canadian Landscape & Nursery Association, jointly. All work and materials shall meet standards as set out in the Canadian Landscape Standard unless superseded by this specification or as directed by Landscape Architect with written instruction.

.3 MASTER MUNICIPAL SPECIFICATIONS & STANDARD DETAILS, 2003 edition, prepared by the Consulting Engineers of British Columbia, Roadbuilders and Heavy Construction Associaties, and the Municipal Engineers Division

.4 STANDARD FOR LANDSCAPE IRRIGATION SYSTEM, 2009 Prepared by the Irrigation Industry Association of British Columbia.

.5 MUNICIPAL BYLAWS AND ENGINEERING SPECIFICATIONS WHERE NOTED.

1.2 TESTING

.1 A current (not more than one month) test for all growing medium to be used on this site is required. Provide and pay for testing by an independent testing facility pre-approved by the Landscape Architect. Deliver growing medium test results to Landscape Architect for review and approval prior to placement. Refer to Section 3.4 Growing Medium Testing for procedure.

.2 Owner reserves the right to test or re-test materials. Contractor responsible to pay for testing if materials do not meet specification.

1.3 SUBMITTALS

.1 Any alternate products differing from that contained in the contract documents must be pre-approved by the Landscape Architect.

.2 Submittals to consist of product sample or manufacturer's product description.

1.4 SITE REVIEW

.1 Under the terms of the Landscape Architect's Contract with the Owner and where the Landscape Architect is the designated reviewer, the Landscape Architect will observe construction as is necessary in their opinion to confirm conformance to the plans and specifications. Contact Owners Representative to arrange for site observation at the appropriate times. Allow two days notice. Observation schedule may include but will not be limited to the following:
.11 Start Up Site Meeting, General Contract: Prior to any site disturbance, a meeting with the general contractor to review tree preservation issues, general landscape issues and municipal requirements.
.12 Start Up Site Meeting, Landscape Contract (if separate): At the start of work with Owner's Representative, Site Superintendent and Landscape Contractor; a meeting is to be held to review expected work and to verify the acceptability of the subgrade and general site conditions to the Landscape Contractor. Provide growing medium test results for this meeting.
.13 Progress Site Visits: To observe materials and workmanship as necessary through the course of the work. Review of different aspects of the work may be dealt with on any single visit. Such elements may include: Site Layout, Rough Grading, Growing Medium - quality, depths, finish grading, Drainage and Drainage Materials, Lawns or Grass areas; Planting - plant material including negotiations with suppliers, nursery inspections, plant sizes, quality, quantity, planting practice and layout, tree support; Mulch; Irrigation Systems; Play Equipment; Site Furniture; and other elements of the site development where the Landscape Architect is the designated reviewer such as: Pedestrian Paving, Fencing, Non-structural walls and slabs, Unit Paving.
.14 Substantial Performance Review of all work, accounting of all substitutions, deletions, plant counts, preparations of deficiency list, and recommendations for completion.
.15 Certificate of Completion Upon the declaration of Substantial Performance, a recommendation for the issuance of the Certificate of Completion will be made to the Payment Certifier as defined in the contract.
.16 Deficiency Review Prior to the completion of the holdback period, check for completion of deficiencies. Once completed, a Schedule 'C' will be issued where required.
.17 Warranty Review Prior to the completion of the warranty period (i.e.-11 months after issuance of the Certificate of Completion), review all warranty material and report recommendations for warranty replacement.

1.5 WORKMANSHIP

.1 Unless otherwise instructed in the Contract Documents, the preparation of the subgrade shall be the responsibility of the General Contractor. Placement of growing medium constitutes acceptance of the subgrade by the Landscape Contractor. Any subsequent corrections to the subgrade required are the responsibility of the Landscape Contractor.

.2 All work and superintendence shall be performed by personnel skilled in landscape contracting. In addition, all personnel applying herbicides and/or pesticides shall hold a current license issued by the appropriate authorities.

.3 A site visit is required to become familiar with site conditions before bidding and before start of work.

.4 Confirm location of all services before proceeding with any work.

.5 Notify Landscape Architect of any discrepancies. Obtain approval from Landscape Architect prior to deviating from the plans.

.6 Take appropriate measures to avoid environmental damage. Do not dump any waste materials into water bodies. Conform with all federal, provincial and local statutes and guidelines.

.7 Collect and dispose of all debris and/or excess material from landscape operations. Keep paved surfaces clean and repair damage resulting from landscape work. Repairs are to be completed prior to final acceptance.

.8 Where new work connects with existing, and where existing work is altered, make good to match existing undisturbed condition.

1.6 WARRANTIES

.1 Guarantee all materials and workmanship for a minimum period of one full year from the date of Certificate of Completion.

.2 Refer to individual sections for specific warranties.

PART TWO SCOPE OF WORK

2.1 SCOPE OF WORK

.1 Other conditions of Contract may apply. Confirm Scope of Work at time of tender.

.2 Work includes supply of all related items and performing all operations necessary to complete the work in accordance with the drawings and specifications and generally consists of the following:

2.1 Retention of Existing Trees where shown on drawings.
2.2 Finish Grading and Landscape Drainage.
2.3 Supply and placement of growing medium.
2.4 Testing of imported growing medium and/or site topsoil.
2.5 Supply and incorporation of additives to meet requirements of soil test and Table One.
2.6 Preparation of planting beds, supply of plant material and planting.
2.7 Preparation of rough grass areas, supply of materials and seeding.
2.8 Preparation of lawn areas, supply of materials and sodding.
2.9 Supply and placement of bark mulch.
2.10 Maintenance of planted and seeded/sodded areas until accepted by Owner.
2.11 SEPARATE PRICE: Establishment Maintenance, Section 3.11.
2.12 Other work: Work other than this list, not specified by Landscape Architect.

2.2 MATERIALS

.1 Growing Medium: Conform to Canadian Landscape Standard for definitions of imported and on-site topsoil. Refer to Table One below.

TABLE ONE: PROPERTIES OF GROWING MEDIUM FOR LEVEL 2 GROOMED AND LEVEL 3 MODERATE AREAS
Canadian System of Soil Classification Textural Class: "Loamy Sand" to "Sandy Loam"

Applications	Low Traffic Areas. Trees and Large Shrubs	High Traffic Lawn Areas	Planting Areas and Planters
Growing Medium Types	1L	2M	2P
Texture	Percent Of Dry Weight of Total Growing Medium		
Coarse Gravel: larger than 25mm	0 - 1%	0 - 1%	0 - 1%
All Gravel: larger than 2mm	0 - 5%	0 - 5%	0 - 5%
	Percent Of Dry Weight of Growing Medium Excluding Gravel		
Sand: larger than 0.05mm smaller than 2.0mm	50 - 80%	70 - 90%	40 - 80%
Silt: larger than 0.002mm smaller than 0.05mm	10 - 25%	0 - 15%	10 - 25%
Clay: smaller than 0.002mm	0 - 25%	0 - 15%	0 - 25%
Clay and Silt Combined	maximum 35%	maximum 15%	maximum 35%
Organic Content (mass%)	3 - 10%	3 - 5%	10 - 20%
Organic Content (materials)	3 - 5%	3 - 5%	15 - 20%
Acidity (pH)	6.0 - 7.0	6.0 - 7.0	4.5 - 6.5
Drainage	Percolation shall be such that no standing water is visible 60 minutes after at least 10 minutes of moderate to heavy rain or irrigation.		

.2 Fertilizer: An organic and/or inorganic compound containing Nitrogen (N), Phosphate (25), and Potash (soluble 2) in proportions required by soil test.

.3 Lime: Ground agricultural limestone. Heat treatment of the Canadian Landscape Standard.

.4 Organic Additive: Commercial compost product to the requirements of the Canadian Landscape Standard, latest edition and pre-approved by the Landscape Architect. Recommended suppliers: The Answer Garden Products, Fraser Richmond Soils & Fibre, Stream Organics Management.

.5 Sand: Clean, washed pump sand to meet requirements of the Canadian Landscape Standard.

.6 Composted Bark Mulch: 10mm (3/8") minus Fir/Hemlock bark chips and fines, free of chunks and sticks, dark brown in colour and free of all soil, stones, roots or other extraneous matter. Fresh orange in colour bark will be rejected.

.7 Herbicides and Pesticides: If used, must conform to all federal, provincial and local statutes. Appliers must hold current licenses issued by the appropriate authorities in the area.

.8 Filter Fabric: A non biodegradable blanket or other filtering membrane that will allow the passage of water but not fine soil particles. (Such as MIRAFI 140 NL, GEOLON 66.0 OR AMOCO 4545 or alternate product pre-approved by the Landscape Architect.)

.9 Drainage Piping: If required: Schedule 40 PVC nominal sizes.

.10 Drain Rock: Clean, round, inert, durable, and have a maximum size of 19mm and containing no material smaller than 10mm.

.11 Plant Material: To the requirements of the Canadian Landscape Standard. Refer to 3.9, Plants and Planting. All plant material must be provided from a certified disease free nursery. Provide proof of certification.

.12 Sod: Refer to individual sections in this specification.

.13 Supplier and installers of segmental block walls to provide engineered drawings for all walls signed and sealed drawings for all walls, individually, in excess of 1.2m, or combinations of walls collectively in excess of 1.2m. Installations must be reviewed and signed off by Certified Professional Engineer; inlcude cost of engineering services in Tender price.

.14 Miscellaneous: Any other material necessary to complete the project as shown on the drawings and described herein.

PART THREE SOFT LANDSCAPE DEVELOPMENT

3.1 RETENTION OF EXISTING TREES

.1 Prior to any work on site – protect individual trees or plant groupings indicated as retained on landscape plans as vegetation retention areas.
.11 In some instances the Landscape Architect will tag trees or areas to remain. Discuss tree retention areas at a start-up meeting with the Landscape Architect.

.2 A physical barrier must be installed to delineate clearing boundaries. Refer to physical barrier detail. If detail not provided, comply with local municipal requirements.

.3 No machine travel through or within vegetation retention areas or under crowns of trees to be retained is allowed.

.4 Do not stockpile soil, construction materials, or excavated materials within vegetation retention areas.

.5 Do not park, fuel or service vehicles within vegetation retention areas.

.6 No debris fires, clearing fires or trash burning shall be permitted within vegetation retention areas.

.7 No excavations, drain or service trenches nor any other disruption shall be permitted within vegetation retention areas without a review of the proposed encroachment by the Landscape Architect.

.8 Do not cut branches or roots of retained trees without the approval of the Landscape Architect.

.9 Any damage to existing vegetation intended for preservation will be subject to evaluation by an I.S.A. Certified Arborist using the "Guide for Plant Appraisal", Eighth Edition, 1992.
.91 Replacement planting of equivalent value to the disturbance will be required. The cost of the evaluation and of the replacement planting will be the responsibility of the General Contractor and or the person(s) responsible for the disturbance.

.10 In municipalities with specific tree retention/replacement bylaws ensure compliance to bylaws.

.11 In situations where required construction may disturb existing vegetation intended for preservation, contact Landscape Architect for review prior to commencing construction.

3.2 GRADES

.1 Ensure subgrade is prepared to conform to depths specified in Section 3.5, Growing Medium Supply, below. Where planting is indicated close to existing trees, prepare suitable planting pockets for material indicated on the planting plan. Shape subgrade to eliminate free standing water and conform to the site grading and drainage plan.

.2 On slopes in excess of 3:1 trench subgrade across slope to 150mm (6") minimum at 1.5m (5 ft.) intervals minimum.

.3 Scarify the entire subgrade immediately prior to placing growing medium. Re-cultivate where vehicular traffic results in compaction during the construction procedures. Ensure that all planting areas are smoothly contoured after light compaction to finished grades.

.4 Eliminate standing water from all finished grades. Provide a smooth, firm and even surface and conform to grades shown on the Landscape Drawings. Do not exceed maximum and minimum gradients defined by the Canadian Landscape Standard.

.5 Construct swales true to line and grade, smooth and free of sags or high points. Minimum slope 2%, maximum side slopes 10%. Assume positive drainage to collection points.

.6 Slope not to exceed the following maximums: Rough Grass 3:1, Lawn 4:1, Landscape plantings 2:1.

.7 Finished soil/mulch elevation at building to comply with municipal requirements.

.8 Inform Landscape Architect of completion of finish grade prior to placement of seed, sod, plants or mulch.

3.3 LANDSCAPE DRAINAGE

.1 Related Work: Growing medium and Finish Grading, Grass areas, Trees Shrubs and Groundcovers, Planters, Crib Walls.

.2 Work Included: Site finish grading and surface drainage. Installation of any drainage systems detailed on landscape plans. Note: Catch basins shown on landscape plans for coordination only, confirm scope of work prior to bid.
.21 Coordinate all landscape drainage work with rest of site drainage. Refer to engineering drawings and specifications for connections and other drainage work.
.22 Determine exact location of all existing utilities and structures and underground utilities prior to commencing work, which may not be located on drawings and conduct work so as to prevent interruption of service or damage to them. Protect existing structures and utility services and be responsible for damage caused.
.23 Plaster drains on slab: Refer to Section 3.10, Installing Landscapes on Structures.

3.4 GROWING MEDIUM TESTING

.1 Submit representative sample of growing medium proposed for use on this project to an independent laboratory. Provide test results to Landscape Architect prior to placing. Test results to include:
.11 Physical properties, % content of gravel, sand, silt, clay and organics.
.12 Acidity PH and quantities of lime or sulphur required to bring within specified range.
.13 Nutrient levels of principle and trace elements and recommendations for required soil amendments.
.14 Carbon/Nitrogen level.

3.5 GROWING MEDIUM SUPPLY AND PLACEMENT

.1 Supply all growing medium required for the performance of the Contract. Do not load, transport or spread growing medium when it is so wet that its structure is likely to be damaged.

.2 Supply all growing medium admixtures as required by the soil test. Amended growing medium must meet the specification for growing medium as defined in Table One for the various areas.
.21 Thoroughly mix required amendments into the full depth of the growing medium.
.22 Special mixes may be required for various situations. Refer to drawing notes for instructions.

.3 Place the amended growing medium in all grass and planting areas. Spread growing medium in uniform layers not exceeding 6" (150mm), over unfrozen subgrade free of standing water.

.4 Minimum depths of growing medium placed and compacted to 80%:
A.1 On-grade:
A.11 Seeded and sodded lawn.....6" (150mm)
A.12 Mass planted shrubs & groundcovers.....18" (450mm)
A.13 Groundcover only areas, if defined on plan.....9" (225mm)
A.14 Tree & large shrub pits.....depth to conform to depth of rootball - width shall be at least twice the width of the root ball with saucer shaped sides.
A.2 On-Slab:
A.21 Irrigated lawn.....9" (225mm)
A.22 Groundcover areas.....12" (300mm)
A.23 Lawn without automatic irrigation.....12" (300mm)
A.24 Shrub & groundcover areas.....18" (450mm)
A.25 Trees and specimen shrubs.....30" (750mm) over volumes and/or edge of slab (verify column locations on-site for tree locations.)
A.26 Depth noted includes 1" to 2" (25-50mm) sand over filter fabric.
A.27 Minimum 18" depth growing medium except where mounded for trees over column points.

.5 Manually spread growing medium/planting soil around existing trees, shrubs and obstacles.

.6 In perimeter seeded grass areas, feather growing medium out to nothing at edges and blend into existing grades.

.7 Finished grades shall conform to the elevations shown on landscape and site plans.

3.6 HYDRO GRASS AREA – SEEDING

.1 General- Rough grass areas are noted on the drawings as "Rough Grass". Treat all areas defined as rough grass between all property lines of the project including all boulevards to edge of roads and lanes.

.2 Preparation of Surfaces: To Canadian Landscape Standard Class 3 Areas (Rough grass) Section 7.1.1.3
.21 Clean existing soil by mechanical means of debris over 50mm in any dimension.
.22 Roughly grade surfaces to allow for maintenance specified and for positive drainage.

.3 Time of Seeding: Seed from early spring (generally April 1st) to late fall (September 15th) of each year. Further extensions may be obtained on concurrence of the Landscape Architect.

.4 Seed Supply & Testing: All seed must be obtained from a recognized seed supplier and shall be No. 1 grass mixture delivered in containers bearing the following information
A.1 Analysis of the seed mixture
A.2 Percentage of each seed type

.5 Seed Mixture: All varieties shall be rated as strong performers in the Pacific Northwest and are subject to client approval.
10% Creeping Red Fescue
20% Annual Rye
55% Saltarn Perennial Rye
15% Kentucky Bluegrass
For Wildflower Areas use a mixture of Wildflowers with Hard Fescues (Terralink Coastal Wildflowers) with Hard Fescue or pre-approved alternate.

.6 Fertilizer: Mechanical seeding: Apply a complete synthetic slow-release fertilizer with maximum 35% water soluble nitrogen and a formulation ratio of 18-18-18 – 50% 3 (15.000ml) diameter circle around trees in lawn areas, leave a clean edge.

.7 Seeding: Apply seed at a rate of 102kl/H (100lbs /acre) with a mechanical spreader. Incorporate seed into the top 1/4" (6mm) of soil and lightly compact.

.8 Acceptance: Provide adequate protection of the seeded areas until conditions of acceptance have been met. Comply with Section 3.7 Hydroseeding.

3.7 HYDROSEEDING

.1 May be used as an alternate to mechanical seeding in rough grass areas.

.2 May not be used in areas of lawn unless pre-approved by the Landscape Architect prior to bidding.

.3 Preparation and Growing Medium
.31 In areas of Rough Grass: Comply with Section 3.6 Rough Grass.
.32 Where approved for use in areas of lawn, comply with Section 3.8 Lawn Areas- Sodding.

.4 Protection: Ensure that fertilizer in solution does not come in contact with the foliage of any trees, shrubs, or other susceptible vegetation. Do not spray seed or mulch on objects not expected to grow grass. Protect existing site equipment, roadways, landscaping, reference points, monuments, markers and structures from damage. Where contamination occurs, remove seeding slurry to satisfaction of and by means approved by the Landscape Architect

.5 Mulch shall consist of virgin wood fibre or recycled paper fibre designed for hydraulic seeding and dyed for ease of monitoring application. If using recycled paper material for wood fibre substitute use 155% by weight. Conform to Canadian Landscape Standard for mulch requirements.

.6 Water: Shall be free of any impurities that may have an injurious effect on the success of seeding or may be harmful to the environment.

.7 Equipment: Use industry standard hydraulic seeder/mulcher equipment with the tank volume certified by an identification plate or sticker affixed in plain view on the equipment. The hydraulic seeder/mulcher shall be capable of sufficient agitation to mix the material into a homogenous slurry and to maintain the slurry in a homogenous state until it is applied. The discharge pumps and gun nozzles shall be capable of applying the materials uniformly over the designated area.

PART THREE SOFT LANDSCAPE DEVELOPMENT - CONT

3.8 Application Rate:
.81 Seed Mixture- 136 kg/ha (125 lbs/acre)
.82 Fertilizer- 112 kg/ha (100 lbs/acre)
.83 Coastal Wildflower Mix: Apply seed mixture, apply (31 lbs/acre) (1/4 lb.: 1 lb. of grass seed)
.84 Notes:
.84.1 At the time of Tender provide a complete chart of all components of the mix proposed including mulch, tackifier, water etc. Sloped sites require tackifier.
.84.2 Fertilizer:
.84.21 Rough Grass: If a soil analysis is available, comply with results.
.84.22 Lawn: Where hydroseeding is approved, comply with soil analysis recommendations.

.9 Hydroseeding requires the quantities of each of the materials to be charged into the tank either by mass or by a commonly accepted system of mass-calibrated volume measurements. The materials shall be added to the tank while it is being filled with water, in the following sequence; seed, fertilizer. Thoroughly mix into a homogenous slurry. After charging, add no water or other material to the mixture. Do not leave slurry in the tank for more than four (4) hours.

.10 Distribute slurry uniformly over the surface of the area to be hydroseeded. Blend application into previous applications and existing grass areas to form uniform surfaces.

.11 Clean up: Remove all materials and other debris resulting from seeding operations from the job site.

.12 Maintenance: Begin maintenance immediately after seeding and continue for 60 days after Substantial Completion and until accepted by the Owner. Re-seed or three week intervals where germination has failed. Protect seeded areas from damage with temporary wire or twine fences complete with signage until grass area is taken over by the Owner. Water in sufficient quantities to ensure deep penetration and at frequent intervals to maintain vigorous growth until grass is taken over by the Owner. It is the Owner's responsibility to supply water at no extra cost to the Contract.

.13 Acceptance of the Rough Grass Areas: Proper germination of all specified grass species is the responsibility of the Landscape Contractor. The grass shall be reasonably well established, with no apparent dead or bare spots and shall be reasonably free of weeds (to Canadian Landscape Standard, Section 13 Maintenance Level 4: 10per spaces). Sixty days after substantial completion, areas meeting the conditions above will be taken over by the Owner. Areas seeded in Fall will be accepted in Spring one month after start of growing season, provided that the above conditions for acceptance are fulfilled.

3.8 LAWN AREAS – SODDING

.1 General- Treat all areas defined as lawn areas on the landscape plan between all property lines of the project including all boulevards to edge of roads and lanes.

.2 Growing Medium- Comply with Section 2.2.1, Growing Medium. Prior to sodding, request an inspection of the finished grade, and depth and condition of growing medium by the Landscape Architect.

.3 Time of Sodding: Sod from April 1st to October 1st. Further extensions may be obtained on concurrence of the Landscape Architect.

.4 Sod Supply: Conform to all conditions of Canadian Landscape Standard, Section 8, B.C. Standard for Turfgrass Sod.

.5 Specified Turfgrass by area: Refer to Table 2 below.

TABLE 2 SPECIFIED TURFGRASS BY AREA

Area	Description	Quality Grade	Major Species
CLASS 1	Lawn, all areas noted on drawings as lawn in urban development sites including boulevard grass	No. 1 Premium	Kentucky Blue for sun, Fescues for shade
CLASS 2	Grass – public parks, industrial and institutional sites	No. 2 Standard	same
CLASS 3	Rough Grass	see hydroseeding	
SPECIAL			

.6 Lime: The lime shall be as defined in Section 2.2.3, Materials. Apply at rates recommended in required soil test. Refer to Section 3.4 for method.

.7 Fertilizer: Refer to Section 2.2.2 Materials. Apply specified fertilizer at rates shown in the required soil test. Apply with a mechanical spreader. Cultivate into growing medium 48 hours prior to sodding. Apply separately from lime.

.8 Sodding: Prepare a smooth, firm, even surface for laying sod. Lay sod staggered with sections closely butted, without overlapping or gaps, smooth and even with adjoining areas and slightly. Water to obtain moisture penetration of 3" to 4" (7 – 10cm). Comply with requirements of Canadian Landscape Standard Section 8, BC Standard for Turfgrass Sod.

.9 Maintenance: Begin maintenance immediately after sodding and continue for 60 days after Substantial Completion and until accepted by the Owner. Protect sodded areas from damage with temporary wire or twine fences complete with signage until grass is taken over by the Owner. Water to obtain moisture penetration of 3" to 4" (7- 10cm) of soil immediately installed. Scheduled applications of water should be when rainfall has penetrated the soil fully as required.
.92 Mulch: Maintain mulches in the original areas and to the original depths.
.93 Weed Control: Remove all weeds from all areas of lawn once per month during the growing season by hoeing or cultivation to a maximum depth of 90mm, hand-pulling, or, if necessary, by the use of herbicides.
.94 Pest and Disease Control: Inspect all planted areas for pests and diseases periodically and at least every two months during the growing season by an experienced person. Carry out treatment for pests or diseases promptly and consistently for maximum effectiveness. Comply with B.C. Pesticide Control Act and municipal requirements.
.95 Tree Support: Maintain stakes, guy wires and ties one full growing season. Check ties at least every two months to ensure that they are not causing a depression in the bark. Loosen, repair or replace ties as necessary. Remove all stakes guy wires and ties after the first growing season except where large trees require continuing support in the opinion of the Landscape Architect. All flagging of guy wires shall be visible and in good repair.
.96 Pruning: Inspect all trees and shrubs at least every two months during the growing season; prune to remove all dead, weak or diseased wood. Maintain the natural shape of the plant. Carry out clipping or shaping only if required in the maintenance contract for specific conditions or conditions.
.97 Fertilizing: Once during the twelve month period of establishment maintenance fertilize shrubs, trees and groundcovers according to soil analysis requirements.

.9 Grass Areas Establishment:
.91 Watering: Use hoses and sprinklers, irrigation systems or other methods to apply water to Class 1 and Class 2 grassed areas (Canadian Landscape Standard, Section 7, Lawns and Grasses) such that the grass is maintained in a turgid condition. Supply and irrigate with water in the event of any irrigation system malfunction, or incomplete installation at no expense to the owner. Apply water to prevent packing or erosion of the soil. Apply water at a rate and duration so that the water content in the growing medium reaches field capacity to the full depth of the growing medium. Apply water again when the water content reaches 25% of field capacity.
.92 Weed, Insect and Disease Control: Inspect grass areas each time they are mowed for weeds, insect pests, and diseases and treat promptly when necessary by appropriate manual methods, or by the use of chemicals in compliance with the B.C.S.L.A./B.C.L.N.A. Landscape Standards latest edition. Kill broadleafed weeds in grassed areas by a general application of a suitable herbicide if the weed population exceeds 19 broadleaf weeds or 50 annual weeds or weedy grasses per 40 square meters. This application shall reduce the weed population to zero.
.93 Fertilizing: According to soil analysis.
.94 Liming: According to soil analysis
.95 Mowing and Trimming – All areas: The first four cuts shall be a sharp rotary type mower. Excess grass clipping shall be removed after each cut. Mow all grassed areas with a sharp reel or rotary mower when the grass reaches a height of 60mm. Mow to a height of 40mm. Edge with a mechanical vertical cutting edge once per year in March. Remove all grass clippings after each cut.
.96 Aeration: Aeration not required in the first growing season. If necessary, in the second growing season, aerate in early May with a suitable mechanical corer. Core to a depth of 100mm. (4"), and remove cores.
.97 Repairs: Re-grade, re-seed or re-sod when necessary to restore damaged or failing grass areas. Match the grass varieties in the surrounding area. Re-sod, if required, throughout the growing season. Re-seed between April 1st and April 15th or between September 1st and September 15th. Protect re-seeded areas and keep moist until the first mowing.

PART THREE SOFT LANDSCAPE DEVELOPMENT - CONT

.10 For all plant material, the Landscape Architect reserves the right to extend the Contractor's responsibility for another growing season if, in his opinion, leaf development and growth is not sufficient to ensure future satisfactory growth.
.10.5 Where the Owner is responsible for plant maintenance and has not provided adequate maintenance, the plant replacement section of the contract may be declared void. The Landscape Architect shall determine whether maintenance has been satisfactory using the Canadian Landscape Standard, Section 13, Maintenance as the guide. The required maintenance standard is a minimum of Level Three – Medium. Refer to Section 3.11, Establishment Maintenance.
.10.6 The Landscape Contractor is responsible to replace any plant material or repair any construction included in the Contract that is damaged or stolen until the issuance of the Certificate of Completion.
.10.7 Deviation from the specifications may require extension of the Warranty Period as determined by the Landscape Architect.

3.10 INSTALLING LANDSCAPE ON STRUCTURES

.1 Verify that drainage and protection material is completely installed and accepted before beginning work. Contact Landscape Architect for instructions if not in place.

.2 Coordinate work with construction of planters and planter drainage.
2.1 Verify that planter drains are in place and positive drainage to roof drains is present prior to placing any drain rock or soil.

.3 Provide clean out at all through-slab drain locations. Use 300mm min. dia. PVC Pipe filled with drain rock unless specific drawing detail shown.

.4 Install drain rock evenly to a minimum depth of 4" (100mm)or alternate sheet drain if specified. Install sheet drain as per manufacturer's recommendations.

.5 Cover drain rock for alternate sheet drain if specified on drawing details) with filter fabric lapping 6" (150mm) at all edges. Obtain approval of drainage system prior to placing growing medium.

.6 Place an even layer of 25 – 50mm clean washed pump sand over filter fabric.

.7 Place growing medium to depths specified in Section 3.5 above for various surface treatments. Refer to Drawing details for any light weight filler required to other grade. Use Styrofoam block over drain rock shaped to provide smooth surface transition at edges. Butt each piece tightly together and cover with filter fabric to prevent soil from migrating downward.

3.11 ESTABLISHMENT MAINTENANCE (Provide a separate price for this section)

.1 Intent: The intent of "establishment" maintenance is to provide sufficient care to newly installed plant material for a relatively short period of time to ensure or increase the long term success of the planting. The objective is the adaptation of plants to a new site in order to obtain the desired effect from the planting while reducing the rate of failure and unnecessary work associated with improper establishment. Establishment of maintenance procedures apply to all new and retained vegetation including cultivated turfgrass areas and new trees and shrubs.

.2 Maintenance Period: Provide maintenance of installed landscaping for 12 months following substantial completion.

.3 Related Standards and Legislation: Canadian Landscape Standard, latest edition; Fertilizer Code, B.C. Pesticide Control Act.

.4 Site Review: In addition to the inspections at substantial completion, at final progress draw application, and at the end of the guarantee period, there should be three other reviews during the 12 months attended by the Contractor and a designated representative of the Owner. Maintain a logbook and reporting procedures and submit to the designated representative.

.5 Scheduling: Prepare a schedule of anticipated visits and submit to designated representative at start-up. Maintenance operations shall be carried out predominately during the growing season between March 1st and November 30th, however visits at other times of the year may be required.

.6 Maintenance Level: Comply with B. C. Landscape Standard, Section 14, Table 14.2, Maintenance Level 2 "Groomed".

.7 Materials: Comply with Part Two of this specification.
3.1 Fertilizers: To the requirements of the Canadian Landscape Standard. Formulations and rates as required by soil testing.

.8 Plant Material Establishment:
.81 Watering: During the first growing season, water new plants at least every ten (10) days between April 1st and July 31st, and every twenty (20) days between August 1st and September 15th. Minimum 25 gallons per tree per application. During the second growing season, water new plants at least every twenty days between April 1 and July 31 and once between August 1st and September 31st. Apply water at a rate and duration such that the water content reaches field capacity to the full depth of the growing medium. Apply water again when the water content reaches 25% of field capacity. Provide and irrigate with water in the event that any automatic irrigation system malfunctions or has not been completely installed. Scheduled applications of water should be when rainfall has penetrated the soil fully as required.
.82 Mulch: Maintain mulches in the original areas and to the original depths.
.83 Weed Control: Remove all weeds from all areas of lawn once per month during the growing season by hoeing or cultivation to a maximum depth of 90mm, hand-pulling, or, if necessary, by the use of herbicides.
.84 Pest and Disease Control: Inspect all planted areas for pests and diseases periodically and at least every two months during the growing season by an experienced person. Carry out treatment for pests or diseases promptly and consistently for maximum effectiveness. Comply with B.C. Pesticide Control Act and municipal requirements.
.85 Tree Support: Maintain stakes, guy wires and ties one full growing season. Check ties at least every two months to ensure that they are not causing a depression in the bark. Loosen, repair or replace ties as necessary. Remove all stakes guy wires and ties after the first growing season except where large trees require continuing support in the opinion of the Landscape Architect. All flagging of guy wires shall be visible and in good repair.
.86 Pruning: Inspect all trees and shrubs at least every two months during the growing season; prune to remove all dead, weak or diseased wood. Maintain the natural shape of the plant. Carry out clipping or shaping only if required in the maintenance contract for specific conditions or conditions.
.87 Fertilizing: Once during the twelve month period of establishment maintenance fertilize shrubs, trees and groundcovers according to soil analysis requirements.

.9 Grass Areas Establishment:
.91 Watering: Use hoses and sprinklers, irrigation systems or other methods to apply water to Class 1 and Class 2 grassed areas (Canadian Landscape Standard, Section 7, Lawns and Grasses) such that the grass is maintained in a turgid condition. Supply and irrigate with water in the event of any irrigation system malfunction, or incomplete installation at no expense to the owner. Apply water to prevent packing or erosion of the soil. Apply water at a rate and duration so that the water content in the growing medium reaches field capacity to the full depth of the growing medium. Apply water again when the water content reaches 25% of field capacity.
.92 Weed, Insect and Disease Control: Inspect grass areas each time they are mowed for weeds, insect pests, and diseases and treat promptly when necessary by appropriate manual methods, or by the use of chemicals in compliance with the B.C.S.L.A./B.C.L.N.A. Landscape Standards latest edition. Kill broadleafed weeds in grassed areas by a general application of a suitable herbicide if the weed population exceeds 19 Broadleaf weeds or 50 annual weeds or weedy grasses per 40 square meters. This application shall reduce the weed population to zero.
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.97 Repairs: Re-grade, re-seed or re-sod when necessary to restore damaged or failing grass areas. Match the grass varieties in the surrounding area. Re-sod, if required, throughout the growing season. Re-seed between April 1st and April 15th or between September 1st and September 15th. Protect re-seeded areas and keep moist until the first mowing.

pmg LANDSCAPE ARCHITECTS
Suite C100 - 4185 Still Creek Drive
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SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
6	23.JAN.23	UPDATE PER CITY COMMENTS	CLG
5	22.DEC.16	ADP COMMENTS & ISSUE FOR SUBMISSION	CLG
4	22.OCT.24	ADD PROPERTY LINE TAGS	CLG
3	22.OCT.07	ISSUED FOR PERMIT	CLG
2	22.SEP.22	ISSUE FOR DP	CLG
1	22.SEP.15	UPDATE PER NEW SITE PLAN / 95% DRAWINGS	CLG

CLIENT:

PROJECT:
COMMERCIAL DEVEOPMENT

AT BROOKS LANDING
2180 HIGHLAND BLVD.
NANAIMO, B.C.

DRAWING TITLE:
LANDSCAPE SPECIFICATIONS

DATE: 22.AUG.23
SCALE: NO SCALE
DRAWN: MM
DESIGN: MM
CHK'D: MCY

DRAWING NUMBER: **L3**
OF 4

PMG PROJECT NUMBER: **22-176**

22176-5.ZIP

PART ONE - GENERAL

1.1 COPYRIGHT

.1 The Structural Soil specification is provided as an instrument of service and remains the property of PMG landscape Architects. 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 PMG Landscape Architects.

1.2 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.

1.3 RELATED WORK

.1 Section 02100, Landscape Requirements
.2 Section 02110, Landscape Drainage
.3 Section 02810, Irrigation System
.4 Section 02933, Sodding (Seeding)
.5 Section 02906, Planting Trees, Shrubs, and Groundcover

1.4 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

1.5 STANDARDS

.1 BCSLA/BCLNA Landscape Standard (most current edition)

.2 Canadian System of Soil Classification

1.6 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 Reports 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.

1.7 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.

1.8 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 contractors responsibility to inform the Consultant of critical installation times for each phase as noted in Section 1.8.2.

1.9 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

1.10 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.

1.11 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

2.1 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.

TABLE ONE

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 0.05mm - 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	minimum 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%

2.2 AGGREGATE

.1 Clean inert stone of high angularity is preferred over washed gravel.

.2 Stone dimension aspect ratio should approach 1:1:1 with a maximum of 2:1:1 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 1.5 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.

2.3 SOIL STABILIZER

.1 A non-toxic organic binder.
Product: Stabilizer, The Original Natural Binder, as available from Veratec, Aldergrove, BC. 604-607-3002. (Or approved equal)

2.4 GRANULAR BASE

.1 To Master Municipal Specification Section 02226, Aggregates and Granular Materials.

2.5 PAVING MATERIALS

.1 Refer to architectural drawings.

2.6 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: 400 kN
- Tensile Elongation ASTM-D-4632: 50%
- Static CBR Puncture test ASTM D-6241
- Flow Rate ASTM-D-4491 6110 l/min/m^2

.3 Fabric shall be Amoco 4545 or approved equivalent.

PART THREE - EXECUTION

3.1 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.

3.2 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.

3.3 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.

3.4 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.

3.5 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
- 1.25 cu metre of Growing Medium section 2.1
- 2 kg Stabiliser section 2.3
- x 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.

3.6 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)

3.7 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.

3.8 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.

3.9 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 too the contours and elevations indicated on the contract drawings. Ensure positive drainage.

3.10 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.

3.11 TREE PLANTING

.1 Remove structural soil or other backfill material (sand, see comments in section 3.7.7) 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.

3.12 TREE GRATES

.1 Site Furniture and to contract drawings for tree grates, frames and footings.

3.13 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.

3.14 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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SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
6	23.JAN.23	UPDATE PER CITY COMMENTS	CLG
5	22.DEC.16	ADP COMMENTS & ISSUE FOR SUBMISSION	CLG
4	22.OCT.24	ADD PROPERTY LINE TAGS	CLG
3	22.OCT.07	ISSUED FOR PERMIT	CLG
2	22.SEP.22	ISSUE FOR DP	CLG
1	22.SEP.15	UPDATE PER NEW SITE PLAN / 95% DRAWINGS	CLG

CLIENT:

PROJECT:
COMMERCIAL DEVEOPMENT

AT BROOKS LANDING
2180 HIGHLAND BLVD.
NANAIMO, B.C.

DRAWING TITLE:
STRUCTURAL SOIL SPECIFICATIONS

DATE: 22.AUG.23
SCALE: NO SCALE
DRAWN: MM
DESIGN: MM
CHK'D: MCY

DRAWING NUMBER: **L4** **OF 4**

PMG PROJECT NUMBER: **22-176**