TAL-CO SUPPLEMENTAL INSTRUCTION #57			
LANDSCAPE DRAWINGS & SPECIFICATIONS			
Project Name:	**RW TOMLINSON - NEW HEAD OFFICE**		
Project Location:	**100 CitiGate Drive, Ottawa, Ontario**		
ARCH. SI #:	**N/A**	Issued By:	**Chris Simpson**
STRUC. SI #:	**N/A**	Date Issued:	**August 29, 2017**
MECH. SI #:	**N/A**	Revision #:	**N/A**
ELEC. SI #:	**N/A**	Revision Date:	**N/A**

Supplemental Instructions are issued by the Construction Manager to record a clarification or revision to the previously issued Contract Documentation as reflected by the attached information prepared by the identified Professionals.
The Construction Manager shall review the Supplemental Instruction and the attached information and issue to the affected Trade Contractors identifying the following course of action by the Trade Contractor.

Notify TAL-CO within 5 days of receipt, if the attached documents will require a change to Contract Price or Schedule.

Title: **Issued for Construction Landscape Drawings & Specifications**

Reference:

Architectural Construction Update - Issued July 28th, 2017

Site Grading Plan C101 - Rev#13 Issued 17 Aug 2017 (Supplemental Instruction # 53)

Site Servicing & Utility Plan C102 - Rev#10 Issued for Building Permit - 05 Aug 2016

Attachments:

Landscape Drawings - Issued for Construction - 25 Aug 2017

Landscape Specifications - Issued 25 Aug 2017

Description of the Work:

Revised Landscape Plans & Specifications for construction.

Reason:

Issued to contractors for construction.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 12 33.03 – Excavating, Trenching, and Backfill

1.2 REFERENCES

.1 Reference Standards:

.1 ASTM International

.1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-07, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM D624-00(2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.

.4 ASTM D1751-04(2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.

.2 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 CSA International

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA-S269.3-M92 (R2013) - Concrete Formwork

.3 CSA A283-06, Qualification Code for Concrete Testing Laboratories.

.4 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.5 CAN/CSA-A3000-98-A5-98, Portland Cement.

.6 CAN/CSA-G30.5-M1983(R1998), Welded Steel Wire Fabric for Concrete Reinforcement.

.7 CAN/CSA-G30.18-M92(R1998), Billet-Steel Bars for Concrete Reinforcement.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 At least 4 weeks prior to beginning Work, provide Consultant with the following shop drawings:

.1 Placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing.

.2 Drawings showing formwork and falsework design to: CAN/CSA-A23.1.

.3 Provide testing results for review by Consultant do not proceed without written approval when deviations from mix design or parameters are found.

.4 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

.5 Concrete hauling time: provide for review by Consultant deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 QUALITY ASSURANCE

.1 Provide Consultant, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.2 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Consultant:

.1 Falsework erection.

.2 Hot weather concrete.

.3 Curing.

.4 Finishes.

.5 Formwork removal.

.6 Joints.

Part 2 Products

2.1 MATERIALS

.1 Portland Cement: to CSA A3001, Type GU

.2 Joint sealer/filler: grey to CAN/CGSB-19.24, Type 1, Class B.

.3 Premoulded joint fillers:

.1 Bituminous impregnated fiber board: to ASTM D1751.

.4 Formwork: to CAN/CSA-S269.3

.5 Other concrete materials: to CAN/CSA-A23.1.

2.2 MIXES

.1 Proportion concrete in accordance with CAN/CSA-A23.1.

.2 Minimum compressive strength at 32 MPa.

.3 Class of exposure: C1 and C2 to CAN/CSA-A23.1.

.4 Nominal maximum size of coarse aggregate: to CAN/CSA-A23.1.

.5 Additives: fly ash to CAN/CSA-A23.1

.6 Slump: to CAN/CSA-A23.1.

.7 Air content: concrete to contain purposely entrained air in accordance with CAN/CSA-A23.1, Table 10.

.8 Admixtures: to CAN/CSA-A23.1.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Consultant's written approval before placing concrete.

.1 Provide 24 hours minimum notice prior to placing of concrete.

3.2 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2-04.

.2 Anchor bolts.

.1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.

.2 With approval of Representative, grout anchor bolts in preformed holes or holes drilled after concrete has set. Formed holes to be minimum 100 mm diameter. Drilled holes to be minimum 25mm larger in diameter than bolts used to manufacturer's recommendations.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with epoxy grout.

.5 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

3.3 INSERTS

.1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100 mm x 100 mm not indicated, must be approved by Consultant.

3.4 FINISHES

.1 Finish concrete to CSA A23.1/A23.2.

.2 Use procedures as reviewed by Consultant and those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

.3 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.

.4 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.5 Type 1 Concrete Finish (Refer to Plan):

.1 Surfaces shall be finished uniformly with the following finish:

.1 Stiff Broom finish.

.2 Finish concrete to CSA A23.1/A23.2.

.6 Type 2 Concrete Finish (Refer to Plan):

.1 Surfaces shall be finished uniformly with the following finish:

.1 Smooth: Magnesium float concrete. Work float flat on surface using pressure in uniform linear manner to produce surface free from patterns or imperfections. Use magnesium float to provide a smooth texture.

.2 Finish concrete to CSA A23.1/A23.2.

.3 Apply concrete sealer at owner's direction.

.4 To be integrally coloured at owner's direction.

3.5 CONTROL AND EXPANSION JOINTS

.1 Sawcut control and expansion joints in slabs on grade at locations indicated or maximum 4m o.c., in accordance with CAN/CSA-A23.1, and install specified joint sealer/filler.

.2 Sawcut joints as soon as possible after pour, within 24 hours maximum.

.3 Refer to plan for specific jointing layouts.

3.6 SURFACE TOLERANCE

.1 Concrete tolerance to CSA A23.1.

3.7 FIELD QUALITY CONTROL

.1 Site tests: conduct tests as follows and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength at 7 and 28 days.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Consultant for review to CSA A23.1/A23.2.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Contractor will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.

.4 Contractor will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.5 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

.6 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.8 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1 Section 31 23 33.01 – Excavating, Trenching, and Backfilling
.2 Section 31 32 19.01 - Geotextiles
.3 Section 32 93 10 – Trees, Shrubs, and Groundcover Planting

1.2 REFERENCES

.1 Canadian Standard Association (CSA)
  .1 CAN/CSA-A23.1-M94, Concrete Materials and Methods of Concrete Construction.
.2 American Society for Testing and Materials (ASTM)
  .1 ASTM D 698-91, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).

1.3 SOIL REPORT

.1 Examine geotechnical report available from the Owner.

1.4 REGULATIONS

.1 Shore and brace excavations, protect slopes and banks and perform all work in accordance with Provincial and Municipal regulations (whichever is more stringent).

1.5 TESTS AND INSPECTIONS

.1 Testing of materials and compaction of backfill and fills will be carried out by testing laboratory designated by Consultant.
.2 Not later than one week before backfilling or filling, provide to designated testing agency, 23 kg sample of various fills and CU Structural Soil material proposed for use.
.3 Do not begin backfilling or filling operations until material has been approved for use by Consultant.
.4 Not later than 48 hours before backfilling or filling with approved material, notify Consultant so that compaction tests can be carried out by designated testing agency.

1.6 BURIED SERVICES

.1 Before commencing work verify the location of all buried services on and adjacent to the site.
.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.

1.7 PROTECTION

.1 Protect excavations from freezing.

.2 Keep excavations clean, free of standing water, and loose soil.
.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Consultants approval.
.4 Protect buried services that are required to remain undisturbed.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 CU-Structural Soil:
  .1 Acceptable product: CU-Structural Soil™ with granite stone structure by AMEREQ Inc.
    1. Locally supplied by Greely Sand and Gravel Inc.
       1971 Old Prescott St., Greely ON, K4P 1N6.
       (t) 613-821-3003

PART 3 - EXECUTION

3.1 EXCAVATION

.1 Excavate and compact the proposed subgrade to depths, slopes and widths as shown on the drawings. Maintain all required angles of repose of the adjacent materials as shown on the drawings. Do not over excavate compacted subgrades of adjacent pavement or structures.
.2 Do not disturb soil or rock below subgrade elevation. Notify Consultant when excavations are complete. If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work. Excavation taken below depths shown without Consultant's written authorization to be filled with acceptable fill as directed by the Consultant.
.3 Confirm that the subgrade is at the proper elevation and compacted as required. Subgrade elevations shall slope parallel to the finished grade and/or toward the subsurface drain lines as shown on the drawings

3.2 BACKFILLING

.1 Inspection: do not commence backfilling until fill material and spaces to be filled have been inspected and approved by Consultant.
.2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
.3 Confirm subgrade is acceptable compaction for pavement structure with CU-Structural Soil™. If required, compact existing subgrade to 100% SPMDD.
.4 Placing CU-Structural Soil™:
  .1 Install CU-Structural Soil™in 150mm lifts and compact each lift to depths indicated. If bedrock is encountered that will prevent installation of full depth of Soil installation advise Consultant and obtain direction.
  .2 Compact all materials to at least 95% Proctor Density from a standard compaction curve AASHTO T 99 (ASTM D 698). No compaction shall occur when moisture content exceeds maximum as listed herein. Delay compaction if moisture content exceeds maximum allowable and protect CU-Structural Soil™ during delays in compaction with plastic or plywood as directed by the Consultant.

.3 Bring CU-Structural Soil™ to finished grades as shown on the drawings. Immediately protect the CU-Structural Soil™ from contamination by toxic materials, trash, debris, water containing cement, clay, silt or materials that will alter the particle size distribution of the mix with plastic or plywood as directed by the Consultant.

.4 The Consultant may periodically check the material being delivered, prior to installation for color and texture consistency with the approved sample provided by the installing contractor as part of the submittal for CU-Structural Soil™. If the Consultant determines that the delivered CU-Structural Soil™ varies significantly from the approved samples, the Consultant shall contact the licensed producer.

.5 Consultant shall ensure that the delivered structural soil was produced by the approved CU-Structural Soil™ licensee by inspecting weight tickets showing source of material.

.6 CU-Structural Soil™ should not be stockpiled long-term. Any CU-Structural Soil™ not installed immediately must be protected by a tarp or other waterproof covering.

3.3 Fine Grading

.1 After the initial placement and rough grading of the CU-Structural Soil™ but prior to the start of fine grading, the installing contractor shall request review of the rough grading by the Consultant. The installing contractor shall set sufficient grade stakes for checking the finished grades.

.2 Adjust the finish grades to meet field conditions as directed. Provide smooth transitions between slopes of different gradients and direction. Fill all dips with CU-Structural Soil™ and remove any bumps in the overall plane of the slope.

.1 The tolerance for dips and bumps in CU-Structural Soil™ areas shall be a 30mm deviation from the plane in 3m. All fine grading shall be inspected and approved by the Consultant prior to the installation of other items to be placed on the CU-Structural Soil™.

.3 Protect CU-Structural Soil™ until inspected by the Consultant.

3.4 Cover

.1 Coordinate with concrete installer to have concrete granular base immediately installed in accordance with Section 03 30 00 – Cast in Place Concrete.

3.5 Clean-up

.1 Upon completion of the CU-Structural Soil™ installation operations, clean areas within the contract limits. Remove all excess fills, soils and mix stockpiles and legally dispose of all waste materials, trash and debris in accordance with Section 01 74 19 - Waste Management Plan. Remove all tools and equipment and provide a clean, clear site. Sweep, do not wash, all paving and other exposed surfaces of dirt and mud until the paving has been installed over the CU-Structural Soil™ material. Do no washing until finished materials covering CU-Structural Soil™ material are in place.

.2 Dispose of surplus material off site.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33.01 – Excavating Trenching and Backfill

1.2 REFERENCES

.1 Ontario Provincial Standards (OPSS)

.1 OPSS 206 – Grading.

.2 OPSS 180 – Disposal of Materials.

Part 2 Products

2.1 MATERIALS

.1 Fill material: In accordance with of Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.2 Excavated or graded material existing on site suitable to use as fill for grading work if approved by Consultant.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for rough grading installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 GRADING

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to following depths below finish grades:

.1 100 mm for sod areas.

.2 150 mm for seeded areas.

.3 200 for stonedust pathway

.4 350 mm for light duty concrete surfaces

.5 500 mm for heavy duty concrete surfaces

.6 1000 mm for structural soil planting pits.

.7 300-1000 mm for bioswales and planting beds.

.3 Slope rough grade away from building.

.4 Grade ditches to depth as indicated.

.5 Prior to placing fill over existing ground, scarify surface to depth of 150 mm minimum before placing fill over existing ground. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.6 Compact filled and disturbed areas to corrected maximum dry density maximum dry density to ASTM D698, as follows:

.1 85% under landscaped areas.

.2 100% under structural slabs.

.3 100% under paved and walk areas.

.7 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading, or landscaping off site.

3.4 PROTECTION

.1 Protect existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as directed by Consultant. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 30 00 – Cast-In-Place Concrete

.2 Section 31 14 11 – Structural Soil

.3 Section 31 22 13 – Rough Grading

.4 Section 31 32 19 .01 – Geotextiles

.5 Section 32 11 23 – Granular Base

.6 Section 32 15 40 – Crushed Stone Surfacing

.7 Section 32 91 19 .13 – Topsoil and Finish Grading

1.2 REFERENCES

.1 ASTM International

.1 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 600kN-m/m^3.

.2 CSA International

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.3 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 206, Grading

.2 OPSS 1004-05, Material Specification for Aggregates-Miscellaneous.

.3 OPSS 1010, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.3 REGULATIONS

.1 Shore and brace excavations, protect slopes and banks and perform all work in accordance with Provincial and Municipal regulations whichever is more stringent.

1.4 DEFINITIONS

.1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Topsoil:

.1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.

.3 Unclassified excavation: excavation of deposits of whatever character encountered in work.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.5 TESTS AND INSPECTIONS

.1 Testing of materials and compaction or bearing capacity of backfill and base material will be carried out by testing laboratory selected and paid for by the Contractor.

.2 Testing laboratory shall provide written records confirming acceptability of subgrade for pipework installation, acceptability of Granular A material for bedding and pipe surround, acceptability of trench backfill material, and shall provide compaction testing for pipe surround and trench backfill materials.

.3 One set of compaction tests for pipe surround and trench backfill shall be provided for the storm service installed.

1.6 EXISTING CONDITIONS

.1 Buried services:

.1 Before commencing work establish location of buried services on and adjacent to site.

.2 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.3 Prior to beginning excavation Work, notify applicable establish location and state of use of buried utilities and structures. Consultant to clearly mark such locations to prevent disturbance during Work.

.4 Confirm locations of buried utilities by careful test excavations.

.5 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.6 Where utility lines or structures exist in area of excavation, obtain direction of City Representative before removing or re-routing. Costs for such Work to be paid by Consultant.

.7 Record location of maintained, re-routed and abandoned underground lines.

.8 Confirm locations of recent excavations adjacent to area of excavation.

.2 Existing buildings and surface features:

.1 Conduct, with Consultant, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, lighting, wires, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Type 1 fill: Granular 'A' to meet the requirements of the Ontario Provincial Standard Specification OPSS No. 1010.

.2 Type 2 fill: Granular 'B' Type II to meet the requirements of the Ontario Provincial Standard OPSS No.1010.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 PREPARATION/PROTECTION

.1 Protect existing features in accordance with applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Consultant approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.4 EXCAVATION

.1 Advise Consultant at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as indicated or as directed by Consultant.

.3 Excavation must not interfere with bearing capacity of adjacent foundations.

.4 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.5 For trench excavation, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

.6 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Consultant.

.7 Restrict vehicle operations directly adjacent to open trenches.

.8 Excavate trenches to provide uniform continuous bearing and support for minimum of 150 mm thickness of pipe bedding material on solid and undisturbed ground. Trench widths below point 150 mm above pipe not to exceed diameter of pipe plus 600 mm.

.9 Open cut service trench excavations are permitted provided they meet the requirements of the current Ontario Occupational Health and Safety Act.

.10 Dispose of surplus and unsuitable excavated material off site.

.11 Do not obstruct flow of surface drainage or natural watercourses.

.12 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.13 Notify Consultant when bottom of excavation is reached.

.14 Obtain Consultant’s approval of completed excavation.

.15 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Consultant.

.16 Correct unauthorized over-excavation as follows:

.1 Fill under bearing surfaces and footings Type 2 fill compacted to not less than 100% of corrected Standard Proctor maximum dry density.

.2 Fill under other areas with Type 2 fill compacted to not less than 95% of corrected Standard Proctor maximum dry density.

.17 Hand trim, make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.2 Clean out rock seams and fill with concrete mortar or grout to approval of Consultant.

.3 Install geotextiles in accordance with Section 31 32 19.01 – Geotextiles.

3.5 FILL TYPES AND COMPACTION

.1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698.

.1 Basecourses: 100%.

.2 To underside of basecourses: 95%.

.3 Earthfill: 95%

.4 Fill under areas other than bearing surfaces 82-87%

3.6 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 Consultant has inspected and approved installations.

.2 Consultant has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.4 Removal of concrete formwork.

.5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer. Add water as required to achieve specified density.

.1 Place unshrinkable fill in areas as indicated. Consolidate and level unshrinkable fill with internal vibrators.

.5 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.

.6 Backfilling around installations:

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

.7 Under slabs and paving:

.1 Use Type 2 Fill Granular B up to bottom of granular base courses.

.2 Use Type 1 Fill Granular A for base courses.

.8 Blown rock material, not capable of fine grading, is not acceptable, imported material must be placed on this type of material.

.9 Against foundations (except as applicable to trenches and under slabs and paving): excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.

3.7 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Consultant.

.2 Replace topsoil as indicated and as directed by Consultant.

.3 Reinstate lawns to elevation which existed before excavation.

.4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.5 Clean and reinstate areas affected by Work as directed by Consultant.

.6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33.01 – Excavating Trenching, and Backfilling

.2 Section 32 92 19.13 – Mechanical Seeding

1.2 REFERENCES

.1 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 1860-November 2010, Material Specification for Geotextiles.

Part 2 PRODUCTS

2.1 MATERIAL

.1 Geotextile: Standard non-woven synthetic fibre fabric, Maccaferri MacTex MX 255 or approved equal.

.2 Factory seams: sewn in accordance with manufacturer's recommendations.

.3 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

.1 Geotextile:

.1 Place material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with appropriate staples or fill for the required location.

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.3 Place material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.2 Overlap each successive strip of geotextile 300 mm over previously laid strip.

.3 Protect installed material from displacement, damage or deterioration before, during and after placement of material layers.

.4 After installation, cover with overlying layer within 4 hours of placement.

.5 Install material in such a manner that it does not protrude visibly from between materials.

.6 Replace damaged or deteriorated geotextile to approval of Consultant.

.7 Place and compact soil layers in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse or recycling in accordance with Section 01 74 21 - Construction Waste Management.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 03 30 00 – Cast-In-Place Concrete
.2 31 22 13 – Rough Grading
.3 31 23 33.01 – Excavating, Trenching, and Backfilling
.4 32 32 56 – Armourstone and Boulders
.5 32 37 00 – Exterior Site Furnishings

1.2 REFERENCES

.1 Ontario Provincial Standard Specification (OPSS) Volume 1 - 501 – Construction Specification for Compacting
.2 Ontario Provincial Standard Specification (OPSS) Volume 1 – 1001 – Construction Specification for Aggregates
.3 Ontario Provincial Standard Specification (OPSS) Volume 2 – 1010 – Material Specification for Aggregates – Granular A, B, M, and Select Subgrade Material

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and stockpile aggregates in accordance with OPSS 1001 - Aggregates. Stockpile minimum 50% of total aggregate required prior to beginning operation.
.2 Store cement in weather tight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.
.2 Divert unused granular material from landfill to local facility as approved by Municipal Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular base material: in accordance with OPSS 1001 – Aggregates and the following requirements:
.2 Granular A in accordance with OPSS 1010 manufactured from crushed limestone and free from deleterious material.
.3 Granular B Type II in accordance with OPSS 1010 manufactured from crushed limestone and free from deleterious material.
.4 Gradations to be within limits specified when tested to OPSS-1010

PART 3 - EXECUTION

3.1 SEQUENCE OF OPERATION

.1 Place granular sub-base as indicated on subgrade approved by Engineer.
.2 Construct granular sub-base to depth, profile and grade in areas indicated.
.3 Place granular base after sub-base surface is inspected and approved by Engineer.
.4 Placing
    .1 Construct granular base to depth, profile and grade in areas indicated.

.2 Ensure no frozen material is placed.
.3 Place material only on clean unfrozen surface, free from snow and ice.
.4 Begin spreading base material in crown line or on high side of one-way slope.
.5 Place material using methods, which do not lead to segregation or degradation of aggregate.
.6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness. Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
.7 Place material to full width in uniform layers not exceeding 150mm compacted thickness. Engineer may authorize thicker lifts (layers) if specified compaction can be achieved.
.8 Remove and replace that portion of layer in which material becomes segregated during spreading.

.5 Compaction Equipment
.1 Compaction equipment to be capable of obtaining required material densities.

.6 Compacting
.1 Compact to density not less than 100% maximum dry density in accordance with OPSS – 1010 – Material Specification for Aggregates.
.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
.3 Apply water as necessary during compacting to obtain specified density.
.4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Consultant.
.5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

.7 Proof rolling
.1 Where proof rolling reveals defective base or sub-base, remove defective materials to depth and extent as directed by Consultant and replace with new materials in accordance with this section.

3.2 SITE TOLERANCES

.1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.3 PROTECTION

.1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Engineer.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Section 03 30 00 – Cast in Place Concrete

.2 Section 31 23 33 01 - Excavating, Trenching and Backfilling

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

1. ASTM C 136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM C 979-99, Standard Specification for Pigments for Integrally Coloured Concrete.

.2 Canadian Standards Association (CSA).

.1 CSA A23.1/A23.2-94, Concrete Materials and Methods of Construction/Methods of Test for Concrete.

.2 CSA A179-94, Mortar and Grout for Unit Masonry.

.3 CSA-A231. 2-95, Precast Concrete Paving Slabs.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit following product test data:

.1 Sieve analysis for gradation of bedding and joint material.

.2 Unit paver test data.

.2 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.3 Submit full size sample of each type**,** colour and size of paving unit.

1.4 MOCK-UPS

.1 Construct mock-up in accordance with Section 01 45 00 Quality Control.

.2 Install 1 x 1 m area mock-up. Mock-up area will be used to determine surcharge of bedding layer, joints size, lines, laying pattern(s) and texture.

.3 Acceptance of work will be determined by Representative from standard mock-up area.

.4 Protect mock-up for inclusion in work

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Divert unused concrete materials from landfill to local facility as approved by Representative.

.5 Divert unused aggregate materials from landfill to facility for reuse as approved by Representative.

.6 Divert unused geotextiles from landfill to plastic recycling facility approved by Representative.

.7 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 NATURAL STONE PAVERS

.1 Unit pavers: uniform in material, colour, size and from one source.

.2 Natural stone inlays:

.1 Type 1: Main Entrance landscape.

.1 Eramosa limestone split face wall stone

.1 Size: 266 mm wide x ~100 mm thick. Length varies.

.2 Shape: Rectangular shapes.

.3 Colour: Natural.

.4 Pattern: Random, refer to plan.

.5 Finish: None.

.6 Supplier Contact: Andrew Colautti, Cohen and Cohen, 92 Bentley Avenue, Nepean ON K2E 6T9, 613-225-9111, andrew@cohenandcohen.com, or approved equal.

.2 Type 2: Employee Entrance and cafeteria plaza.

.1 Eramosa limestone square cut paving stone.

.1 Size: 305 mm x 610 mm x 38 mm thick.

.2 Shape: Rectangular.

.3 Colour: Natural.

.4 Pattern: Random, refer to plan.

.5 Finish: Flamed.

.6 Supplier Contact: Andrew Colautti, Cohen and Cohen, 92 Bentley Avenue, Nepean ON K2E 6T9, 613-225-9111, andrew@cohenandcohen.com, or approved equal.

2.2 SEALER

.1 Natural Stone Sealer

.1 Exterior and commercial grade natural stone colour enhancer.

.2 INTENSIFIA (QT) Natural Stone Colour Enhancer by DryTreat or approved equal.

2.3 BEDDING AND JOINT MATERIAL

.1 Joint sand: SP Polymeric Sand as supplied and manufactured by Permacon

.1 Supplied by Permacon (Ottawa South)
6860 Bank Street, Metcalfe Ontario, K0A 2P0
(t) 1-888-PERMACON; or approved equal.

2.4 CLEANING RESTRAINTS

.1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of contamination encountered.

2.5 EDGE RESTRAINT

.1 Landscaping edge: Permaloc, www.permaloc.com, Clean Line aluminum landscape edging or equivalent.

.1 Size: 3.2mm x 76mm, 1.83mm thick.

.2 Finish: Mill finish - natural aluminum (MF)

Part 3 Execution

3.1 PROTECTION

.1 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, fences, roads and adjacent property. Make good any damage.

.2 Provide access to building at all times. Coordinate paving schedule to minimize interference with normal use of premises.

3.2 BASE SURFACE

.1 Verify that base surfaces conform to levels and compaction required for installation of unit pavers. If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.

.2 Verify that top of base surface does not exceed plus or minus 10 mm of grade over 3 m straight edge.

.3 Ensure that base surface is not frozen or standing water is present during installation.

3.3 PLACING OF BEDDING MATERIAL

.1 Ensure bedding material is not saturated or frozen at all times until installation is complete.

.2 Maximum thickness after compaction: 25mm.

.3 Spread and screed material on structural surface to achieve 25 mm minimum compacted thickness after vibrating pavers in place. Do not use joint sand for bedding sand.

.4 Do not disturb screeded material. Do not use bedding material to fill depressions in structural surface.

3.4 SUBGRADE

.1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of granular base in accordance with Section 31 23 33 01 Excavation, Trenching and Backfilling.

3.5 GRANULAR BASE

.1 Type 1:

.1 Base minimum thickness: 200 mm.

.2 Spread and compact crushed stone or gravel base in uniform layers not exceeding 100 mm compacted thickness.

.3 Compact base to a density of not less than 95 % Standard Density in accordance with ASTM D698 D1557.

.4 Shape and roll alternately to obtain smooth, even and uniformly compacted granular base and ensure conformity of grades with finish surface.

.5 Apply water as necessary during compaction to obtain specified density. If granular base is excessively moist, remove it and install more granular material to rid it of sponginess.

.6 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

3.6 BEDDING SAND

.1 Place and spread bedding sand to:

.1 Type 1: 25 mm compacted thickness.

.2 Type 2: 12.5mm compacted thickness.

.2 Use material other than bedding sand to compensate for depressions that exceed specified tolerances in surface of base.

.3 Do not use joint sand for bedding sand.

3.7 INSTALLATION OF NATURAL STONE PAVERS

.1 Type 1:

.1 Lay pavers to pattern(s) indicated. Joints between pavers: 2 to 3 mm wide, or as recommended by manufacturer.

.2 Use appropriate end, edge and corner stones. Saw cut pavers to fit around obstructions and at abutting structures.

.3 Where required, cut units accurately without damaging edges.

.4 Inspect, remove, and replace chipped, broken and damaged pavers.

.5 Ensure pavers adjacent to concrete surface are flush to prevent tripping hazards.

.6 Install to create a random, natural appearance with varying heights throughout

.1 Confirm final layout on site with consultant.

.2 Type 2:

.1 Lay pavers to pattern(s) indicated. Joints between pavers: 2 to 3 mm wide, or as recommended by manufacturer.

.2 Use appropriate end, edge and corner stones. Saw cut pavers to fit around obstructions and at abutting structures.

.3 Where required, cut units accurately without damaging edges.

.4 Use a low amplitude, high frequency plate compactor capable of at least 22 kN centrifugal compaction force to vibrate pavers into bedding sand.

.5 Inspect, remove, and replace chipped, broken and damaged pavers.

.6 Sweep joint material into joints.

.7 Settle joints by vibrating pavers with plate compactor.

.8 Continue application of joint material and vibrating of pavers until joints are full. Do not vibrate within 1 m of unrestrained edges of pavers.

.9 Complete installation to within 1 m of laying face, with sand-filled joints, at completion of each work day before any work-stoppage greater than 1 h.

.10 Sweep off excess joint material when installation is complete.

.11 Final surface elevations not to exceed plus or minus 3mm mm under 3 m long straightedge.

.12 Landscape Edging:

.1 Install edging true to grade, as per manufacturer's specifications with top of edging 10mm below finish grade.

.2 Edging shall have a minimum of 50mm (2") of interlocking overlap between sections where possible.

.3 Fasten edging to concrete with appropriate concrete anchor bolt

.4 Finish grade to be compacted on either side of edging to maintain stability.

3.8 CLEANING

.1 Carry out cleaning at times and conditions recommended by manufacturer of cleaning compound, immediately prior to sealing and as directed by Representative.

.2 Remove and dispose of loose, extraneous materials from surfaces to be cleaned.

.3 Apply cleaning compounds appropriate for removal of various contaminants encountered in accordance with manufacturer's recommendations.

.4 Final surface to be free of contamination.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33 – Excavation, Trenching, and Backfilling

.2 Section 31 32 19.01 – Geotextiles

1.2 REFERENCES

.1 ASTM International

.1 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.3 ASTM D4318-05, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

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

.2 Store crushed stone as and where directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Granular base: Type I Granular 'A' in accordance with Section 31 23 33 Excavation, Trenching, and Backfilling and following requirements:

.1 Stonedust Topping:

.1 Clean, hard, durable particles or fragments of crushed 1⁄4" minus limestone meeting the following grading requirements:

1⁄4" Minus Aggregate Gradation

Sieve Designation	Range of % Passing
No. 3/8"	100%
No. 4	95-100

No. 8	75-80
No. 16	55-65
No. 30	40-50
No. 50	25-35
No. 100	20-25
No. 200	5-15

.2 The crushed limestone screenings shall be free from clay lumps, cementation, organic matter, frozen material, and other deleterious material.

.3 Non-woven geotextile to Section 31 32 19.01 – Geotextiles.

Part 3 Execution

3.1 SUBGRADE

.1 Ensure subgrade preparation conforms to levels and compaction required, to allow for installation of granular base.

3.2 STONEDUST TOPPING

.1 Install non-woven geotextile fabric prior to placing stonedust topping on prepared subgrade.

.2 Place granular topping to compacted thickness as indicated.

.1 Compact layer to 95 % Standard Density in accordance with ASTM D698.

3.3 FIELD QUALITY CONTROL

.1 Inspection and testing of crushed stone paving: carried out by designated testing laboratory.

.2 Costs of tests: paid by contractor.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse or recycling in accordance with Section 01 74 21 - Construction Waste Management.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 31 23 33 01 - Excavating, Trenching and Backfilling
.2 Section 31 32 21 - Geotextiles
.3 Section 31 22 13 - Rough Grading

1.3 PROTECTION

.1 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, fences, roads and adjacent property. Make good any damage.

Part 2 Products

2.1 MATERIALS

.1 Riverstone: Size 25-38mm ø. Finish: smooth & weathered. Colour: variable. Free from clay lumps, cementation, organic material, frozen material and other deleterious materials.

.1 Provide sample to Consultant for approval.

.2 Landscaping edge: Permaloc, www.permaloc.com, Clean Line aluminum landscape edging or equivalent.

.1 Size: 3.2mm x 76mm, 1.83mm thick.
.2 Finish: Mill finish - natural aluminum (MF)

.3 Non-woven geotextile to Section 31 32 19.01 – Geotextiles.

Part 3 Execution

3.1 SUBGRADE

.1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of granular base/riverstone.

3.2 LANDSCAPE EDGING

.1 Install edging true to grade, as per manufacturer's specifications with top of edging 25mm (1/2") above finish grade.
.2 Edging shall have a minimum of 50mm (2") of interlocking overlap between sections.
.3 Stake edging through stake pockets or 1 stake per 1200mm (48") of edging, to permanently secure edging in place.
.4 Finish grade to be compacted on either side of edging to maintain stability.

3.3 RIVERSTONE

.1 Install non-woven geotextile fabric prior to placing riverstone on prepared subgrade, ensuring fabric extends along backside of landscape edging.
.2 Install riverstone on geotextile to thickness indicated.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 23 33.01 Excavating, Trenching and Backfilling
.2 Section 31 22 13 Rough Grading
.3 Section 31 32 19.01 Geotextiles

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Quarried Armour Stone:
  .1 Local quarried granite rock sourced from road construction or other local sources.
    .1 Type 1 Armour Stone:
      .1 Size: 450mm minimum wide x 350-400mm high x 850-900mm long with generally flat surfaces, unfractured and solid. Rock shall be to the approval of the Consultant.
      .2 Finish: weathered. Colour: varies.
    .2 Type 2 Armour Stone
      .1 Size: 450mm minimum wide x 350-400mm high x 1600-1800mm long with generally flat surfaces, unfractured, and solid. Rock shall be to the approval of the Consultant.
      .2 Finish: weathered. Colour: varies.

.2 Landscape Boulders:
  .1 Granite boulders approved by Consultant.
    .1 Type 1 Landscape Boulder: Feature
      .1 As sourced by owner, min. 2000mm, max. 3000mm height.
      .2 Finish: weathered. Colour: varies.
      .3 Boulders to be free of cracks and sharp corners and edges.
    .2 Type 2 Landscape Boulder: Regular
      .1 As sourced by owner, size as approved by Consultant.
      .2 Finish: weathered. Colour: varies
      .3 Boulders to be free of cracks and sharp corners and edges.

.3 Granular Base: Granular A and/or B as per Section 31 23 33.01 Excavating, Trenching, and Backfilling.

.4 Non-Woven Geotextile Fabric: as per Section 31 32 21 Geotextiles.

PART 3 - EXECUTION

3.1 Subgrade

.1 Ensure that subgrade preparation conforms to at least 95% Standard Proctor maximum dry density required to properly install granular base.

3.2 Armour Stone Installation

.1 Clean boulders prior to placement with potable water to remove foreign matter and blemishes.
.2 Place Armour rock as indicated on drawings and to approval of Consultant.
.3 Handle boulders to prevent scratching or breaking.
.4 Place rocks on completed granular base. Armour Rock to be buried into grade to a minimum depth of 150mm.
.5 Position Armour Rock to ensure a stable, smooth, and aesthetic appearance to approval of Consultant.
.6 Ensure there are no pinch or entrapment points between stones.
.7 Brush Armour Rock clean of foreign matter and dirt after installation.

3.3 Landscape Boulder Installation

.1 Clean boulders prior to placement with potable water to remove foreign matter and blemishes.
.2 Place landscape boulders as indicated on drawings and to approval of Consultant.
.3 Handle boulders to prevent scratching or breaking.
.4 Place Boulders on compacted subgrade. Bury minimum 1/3 height of Boulder.
.5 Position Boulder to ensure a stable, smooth, and aesthetic appearance to approval of Consultant.
.6 Spaces between Boulders to be minimum 300mm.
.7 Brush Boulders clean of foreign matter and dirt after installation.

3.4 Protection

.1 Prevent damage to landscaping, walkways, trees, fences, and adjacent property. Make good any damage.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 30 00 – Cast in Place Concrete

1.2 REFERENCE STANDARDS

.1 Canada Green Building Council (CaGBC)

- .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations (including Addendum 2007).
- .2 LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations 2009.
- .3 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Commercial Interiors.
- .4 LEED Canada-EB: O&M-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Existing Buildings: Operations and Maintenance 2009.

.2 CSA International

- .1 CAN/CSA-Z809-08 (R2013), Sustainable Forest Management.

.3 Forest Stewardship Council (FSC)

- .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

.4 Sustainable Forestry Initiative (SFI)

- .1 SFI-2010-2014 Standard.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

- .1 Provide manufacturer's instructions, printed product literature and data sheets for furniture and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

- .1 Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

.4 Sustainable Design Submittals:

- .1 LEED Canada submittals: in accordance with Section 01 35 21- LEED Requirements.
- .2 Construction Waste Management:
  - .1 Provide project Waste Management Plan highlighting recycling and salvage requirements.

.2 Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50 - 75% of construction wastes were recycled or salvaged.

.3 Recycled Content:

.1 Provide listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer/post-industrial content, and total cost of materials for project.

.2 Provide evidence, when Supplementary Cementing Materials (SCMs) are used, to certify reduction in cement from Base Mix to Actual SCMs Mix, as percentage.

.4 Regional Materials: Provide evidence that project incorporates required percentage 10 - 20% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

.5 Wood Certification: Provide manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for care and cleaning of site furnishings for incorporation into manual specified in Section 01 78 00- Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Sustainable Standards Certification:

.1 Certified Wood: Provide listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

1.6 DELIVERY, STORAGE AND HANDLING

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect furnishings from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Develop Waste Management Plan related to Work of this Section and in accordance with Section 01 35 21- LEED Requirements.

.5 Packaging Waste Management: remove for reuse and recycling in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 BENCH

.1 Product Name: Neoliviano Bench

.1 Description: Bench with backrest, 69” long, factory assembled.
.2 Finish/Colour: Anodized aluminum supports and arms, Jarrah wood.
.3 Supply eight (8) surface mounted benches with tamper-proof stainless steel anchor bolts and mounting screws and install according to manufacturer’s installation instructions.
.4 Manufacturer: Landscape Forms, 7800 E. Michigan Avenue, Kalamazoo, MI 49048-9543. T: 800.531.2546, F: 269.381.3455, E: comments@landscapeforms.com, W: www.landscapeforms.com, or approved equal.

2.2 TABLE

.1 Product Name: Chipman Table

.1 Description: Table with umbrella hole, 36” diameter, 29” height.
.2 Finish/Colour: Cast aluminum base, with silver powdercoat. Cast aluminum support tube, with silver powdercoat. Cast aluminum frame, with silver powdercoat. Steel sheet top, with silver powdercoat.
.3 Supply seventeen (17) surface mounted tables with tamper-proof stainless steel anchor bolts and mounting screws and install according to manufacturer’s installation instructions.
.4 Manufacturer: Landscape Forms, 7800 E. Michigan Avenue, Kalamazoo, MI 49048-9543. T: 800.531.2546, F: 269.381.3455, E: comments@landscapeforms.com, W: www.landscapeforms.com, or approved equal.

2.3 CHAIR

.1 Product Name: Chipman Chair.

.1 Description: Chair with back and arms.
.2 Finish/Colour: Aluminum castings, with silver powdercoat.
.3 Supply sixty (60) chairs and install according to manufacturer’s installation instructions.
.4 Manufacturer: Landscape Forms, 7800 E. Michigan Avenue, Kalamazoo, MI 49048-9543. T: 800.531.2546, F: 269.381.3455, E: comments@landscapeforms.com, W: www.landscapeforms.com, or approved equal.

2.4 WASTE RECEPTACLE

.1 Product Name: MultipliCITY Litter.

.1 Description: Double-unit litter receptacle with multi-use opening.
.2 Finish/Colour: Vertical aluminum extrusion spine.Two-winged aluminum castings, with silver powdercoat. Roto-moulded polyethylene bin.
    .1 Signs: clear anodized finish.
        .1 Bin 1: Sign #8 and multi-use opening.
        .2 Bin 2: Sign #13.
.3 Supply three (3) embedded waste receptacles with threaded rod, washer, and nut and install according to manufacturer’s installation instructions.
.4 Manufacturer: Landscape Forms, 7800 E. Michigan Avenue, Kalamazoo, MI 49048-9543. T: 800.531.2546, F: 269.381.3455, E: comments@landscapeforms.com, W: www.landscapeforms.com, or approved equal.

2.5 BIKE RACK

.1 Product Name: Ring Bike Rack.

.1 Description: Single circular bike rack.
.2 Finish/Colour: Stainless steel tubing with electropolish finish.
.3 Supply thirteen (13) embedded bike racks and install according to manufacturer's installation instructions.
.4 Manufacturer: Landscape Forms, 7800 E. Michigan Avenue, Kalamazoo, MI 49048-9543. T: 800.531.2546, F: 269.381.3455, E: comments@landscapeforms.com, W: www.landscapeforms.com, or approved equal.

2.6 ASH URN

.1 Product Name: Humo Ash Urn.

.1 Description: Stainless steel ash urn.
.2 Finish/Colour: Stainless steel.
.3 Supply one (1) surface mounted ash urn with tamper-proof stainless steel anchor bolts and mounting screws and install according to manufacturer's installation instructions.
.4 Manufacturer: Landscape Forms, 7800 E. Michigan Avenue, Kalamazoo, MI 49048-9543. T: 800.531.2546, F: 269.381.3455, E: comments@landscapeforms.com, W: www.landscapeforms.com, or approved equal.

2.7 SMOKING SHELTER

.1 Product Name: TBD

.1 Description:
.2 Finish/Colour:
.3 Manufacturer:

2.8 FENCE

.1 Product name: Omega Max.

.1 Description: 1.2m height fence. 2.5m length.
    .1 Custom panels to be fitted for angled berm walls – quantity and angles to be measured and confirmed on site.
    .2 Panels to be installed with face mount support brackets.
.2 Finish/Colour: Pre-galvanized and polyester powdercoated signal Black RAL 9004.
.3 Wire: 1 x 8 GA vertical and horizontal.
.4 Mesh opening: 0.5" x 3".
.5 Posts: Square, 3".
    .1 Custom posts and angled post mount brackets to be fitted for angled berm walls. Qaunitity and layout to be measured and confirmed on site.
.6 Supply and install fence according to manufacturer's installation instructions.
.7 Manufacturer: Omega II Fence Systems, 1735 St-Elzear Blvd. West, Laval, QC H7L 3N6. T: 800.836.6342, F: 450.681.7905. E: customerservice@omegatwo.com, W: www.omegafence.com, or approved equal.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed Consultant.

3.2 PREPARATION

.1 Locate and protect utility lines.

.2 Notify and acquire written acknowledgement from utility authorities before beginning installation Work

3.3 INSTALLATION

.1 Assemble furnishings in accordance with manufacturer's written recommendations.

.2 Install furnishings in accordance with manufacturer’s written installation instructions..

.3 Touch-up damaged finishes to approval of Consultant.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

.3 Waste Management: separate waste materials for recycling/reuse in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by site furnishings installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 22 13 – Rough Grading

.2 Section 32 92 23 – Sodding

.3 Section 32 92 19 – Hydraulic Seeding

1.2 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 (CCME)

.1 PN1340-2005, Guidelines for Compost Quality.

.2 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, 2009.

.3 Athletic Field Construction Manual, Sports Turf Association, Second edition.

.1 Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 2012 Sampling and Analysis Protocol for Ontario Regulation 267/03, under the Nutrient Management Act, 2002.

.4 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 802, Construction Specification for Topsoil

1.3 DEFINITIONS

.1 COMPOST: A mixture of soil and decomposing organic matter used as a fertilizer, mulch, or soil conditioner. Compost is processed organic matter containing 40% or more organic matter as determined by the Walkley-Black or LOI test. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25), and contain no toxic or growth inhibiting contaminates. Composed bio-solids must meet the requirements of the Guidelines for Compost Quality, Category A produced by the Canadian Council of the Ministers of the Environment (CCME), January 1996.

.2 TOPSOIL: refers to both imported material and material found on-site to be preserved for re-use.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties for all topsoil and planting soil mixes.

.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 Delivery Tickets, receipts and specifications detailing the delivery address, quantities, and product description and sources for Verification by Consultant.

Part 2 Products

2.1 BIOSWALE TOPSOIL

.1 Topsoil for bioswale areas: an amended mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on The Canadian System of Soil Classification, to consist of:

.1 4 parts sandy loam topsoil

.2 1 part peat

.3 1 part organic material, ie. Composted leaves, mushroom compost.

.2 pH of 6.0-7.0

.3 Contain no toxic elements or growth inhibiting materials.

.4 Consistence: friable when moist

.5 Topsoil shall be screened and free from:

.1 Stones and clods over 25 mm diameter.

.2 Coarse vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.3 Subsoil.

.4 Man-made materials (including glass, plastic, and asphalt).

2.2 TOPSOIL

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

.1 Soil texture based on The Canadian System of Soil Classification, to consist of up to 50% sand, up to 30% silt, 5 to 15% clay, and contains 5 to 10 % organic matter.

.2 pH of 6.0-7.0.

.3 Contain no toxic elements of growth inhibiting materials.

.4 Consistency: friable when moist.

.5 Topsoil shall be screened and free from:

.1 Stones and clods over 25mm diameter.

.2 Coarse vegetative material, 10mm diameter and 100mm length occupying more than 2% of soil volume.

.3 Subsoil.

.4 Man-made materials (including glass, plastic, and asphalt).

2.3 IMPORTED PLANTING SOIL

.1 Planting bed and planting pit soil shall be a manufactured planting soil: a mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture to consist of 15 - 20% Compost and up to 85% Topsoil.

.2 Soil to contain no toxic elements or growth inhibiting materials.

.3 pH of 4.5-6.5

.4 Soil to be free from:

.1 Debris and stones.

.2 Coarse vegetative material, 10mm diameter and 100mm length, occupying more than 2% of soil volume.

.5 Consistence: friable when moist.

2.4 SOIL AMENDMENTS

.1 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: 6.5 to 8.0.

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

.3 Organic matter: shall be obtained from a Compost Quality Assurance (CQA) licensed and OMOE/ CCME approved facility and shall comply with the Category “A” compost designation. The amendment material must contain:

.1 Organic matter primarily leaf, yard and bark waste compost of 8-15% by dry weight as determined by Loss-on-Ignition (LOI) and a pH of 6.0 to 8.0.

.2 No uncomposted manure or other organic materials, sphagnum peat or organic amendments that contain sphagnum peat.

.4 Limestone:

.1 Ground agricultural limestone.

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

.5 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.

2.5 SOURCE QUALITY CONTROL

.1 Advise Consultant of sources of topsoil manufactured 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 and K, and organic matter.

.4 Testing of topsoil will be carried out by testing laboratory designated by Consultant.

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

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Install temporary erosion control fabric on/ around drainage structure prior to delivery of topsoil to the satisfaction of the Consultant.

.3 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.4 Remove erosion and sedimentation controls one seed or sod has established and restore and stabilize areas disturbed during removal.

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, stones in excess of 50 mm diameter and other deleterious materials.

.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.

.2 Remove debris which protrudes more than 75 mm above surface.

.3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth as indicated in Section 31 22 13 – Rough Grading.

.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 Rip native subsoil (decompaction) using teeth of an excavator or equivalent to a native subsoil depth of minimum 150-200mm. Tip using a perpendicular pattern

ensuring full site coverage. No ripping within tree protection areas or within 3m of building foundations.

.3 Place topsoil in uniform layers not exceeding 150 mm. Lightly roll or smooth using machinery bucket and repeat. Adjust layer quantities to ensure a settled amended topsoil depth of 300mm and compliance with site grading.

.1 Amended topsoil should be wetted after application, allowed to settle for a minimum of one (1) week and grades adjusted as required prior to installation of turf/plantings.

.4 For sodded areas keep topsoil 15 mm below finished grade.

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

.1 100 mm for sodded areas.

.2 150 mm for seeded areas.

.3 150 mm for berms.

.4 300-500mm for planting beds.

.5 300-1000 mm for bioswales.

.6 Manually spread topsoil/planting soil around trees, shrubs and 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 footprinting.

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 except topsoil not required off site as directed by Consultant.

3.7 CLEANING

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

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

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 31 23 13 – Rough Grading

.2 Section 32 91 21 – Topsoil & Finish Grading

.3 Section 32 93 10 – Tree, Shrub, and Groundcover Planting

.4 Section 32 94 14 – Plant Warranty & Maintenance

1.2 ADMINISTRATIVE REQUIREMENTS

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

.2 Scheduling:

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

.2 Schedule hydraulic seeding grasses mixtures and mixtures between dates recommended by seed supplier and Provincial Agricultural Department.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for seed, tackifier, fertilizer, liquid soil amendments and micronutrients.

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 30 - Health and Safety 01 35 43 - Environmental Procedures.

.3 Submit in writing 7 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.

.4 Samples:

.1 Submit 0.5 kg container of each type of fertilizer used.

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

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

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of The Ontario Horticultural Trades Association.

.2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

.3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturers written instructions.

.2 Delivery and Acceptance Requirements:

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

.2 Inoculant containers to be tagged with expiry date.

.3 Storage and Handling Requirements:

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

.2 Replace defective or damaged materials with new.

1.6 WARRANTY

.1 The duration of the maintenance and warranty phase will be a 1-year period following the date of Substantial Completion of the selected items of this contract.

.2 Contractor hereby warrants that seeding will remain free of defects in accordance with General Conditions CCDC, but for 12 months or 1 full growing season.

.3 End-of-warranty inspection will be conducted by Consultant.

Part 2 Products

2.1 SEED MIXES

.1 Type 1: Architectural Berm Mix, including annual nurse crop.

Latin Name	Common Name	% by seed count
Festuca rubra	Creeping Red Fescue	25%
Festuca brevipila	Ecostar Hard Fescue	23%
Festuca rubra ssp commutate	Chewings Fescue	23%
Lolium perenne	Perennial Rye	21%
Echinacea purpurea	Purple Coneflower	2%
Rudbeckia hirta	Gloriosa Daisy	2%

Verbena hastate	Blue Vervain	2%
Coreopsis lanceolata	Lance-Leaved Tickseed	2%
Nurse Crop		
Lolium multiflora	Annual Ryegrass	100%

.1 Application:

.1 Rate: 25 kg/h.

.2 Method: Terraseed.

.2 In packages individually labelled in accordance with in accordance with Government of Canada "Seeds Act" and "Seeds Regulations" and indicating name of supplier.

.2 Type 2: Seasonally Flooded Mix

.1 Standard “Seasonally Flooded Mixture 8240” including annual ryegrass nurse crop as supplied by Ontario Seed Corporation, or approved equivalent. OSC Seeds, 77 Wellington Street South, Kitchener, ON. T: 1-519-886-0557 W: www.oscseeds.com

.2 Add 5% by weight Typha latifolia (broadleaf cattail) seeds.

.3 Application:

.1 Rate: 25 kg/h.

.2 Method: Terraseed.

.4 In packages individually labelled in accordance with Government of Canada “Seeds Act” and “Seeds Regulations” and indicating name of supplier.

.3 Type 3: Bank Mixture

.1 Standard “8215 Bank Seed Mix” including annual ryegrass nurse crop as supplied by Ontario Seed Corporation, or approved equivalent. OSC Seeds, 77 Wellington Street South, Kitchener, ON. T: 1-519-886-0557 W: www.oscseeds.com

.2 Application:

.1 Rate: 25 kg/h.

.2 Method: Terraseed.

.3 In packages individually labelled in accordance with Government of Canada “Seeds Act” and “Seeds Regulations” and indicating name of supplier.

.4 Type 4: Wildflower Mix

.1 Standard “Claybusters Wildflower Mix” including annual ryegrass nurse crop as supplied by Wildflower Farm, or approved equivalent. Wildflower Farm, 10195 Hwy 12 West, R.R. #2, Coldwater, Ontario. T: 1-866-476-9453 W: www.wildflowerfarm.com

.2 Application:

.1 Rate: 25 kg/h.

.2 Method: Hydroseed.

.3 In packages individually labelled in accordance with Government of Canada “Seeds Act” and “Seeds Regulations” and indicating name of supplier.

.5 Type 5: Woodland Edge Mix

.1 Standard “Woodland Edge Part Shade Mix” including annual ryegrass nurse crop as supplied by Wildflower Farm, or approved equivalent. Wildflower Farm, 10195 Hwy 12 West, R.R. #2, Coldwater, Ontario. T: 1-866-476-9453 W: www.wildflowerfarm.com

.2 Application:

.1 Rate: 25 kg/h.

.2 Method: Hydroseed.

.3 In packages individually labelled in accordance with Government of Canada “Seeds Act” and “Seeds Regulations” and indicating name of supplier.

.6 Type 6: Entrance Mix

Latin Name	**Common Name**	**% by seed count**
Festuca rubra	Creeping Red Fescue	25%
Festuca brevipila	Ecostar Hard Fescue	20%
Festuca rubra ssp commutate	Chewings Fescue	20%
Lolium perenne	Perennial Rye	20%
Bouteloua gracillus	Blue Grama	15%
Nurse Crop		
Lolium multiflora	Annual Ryegrass	100%

.1 Application:

.1 Rate: 25 kg/h.

.2 Method: Hydroseed.

.2 In packages individually labelled in accordance with in accordance with Government of Canada "Seeds Act" and "Seeds Regulations" and indicating name of supplier.

.7 Type 7: Grassland Mix

Latin Name	**Common Name**	**% by seed count**
Festuca rubra	Creeping Red Fescue	27%
Festuca brevipila	Ecostar Hard Fescue	25%
Festuca rubra ssp commutate	Chewings Fescue	25%
Lolium perenne	Perennial Rye	23%
Nurse Crop		
Lolium multiflora	Annual Ryegrass	100%

.1 Application:

.1 Rate: 25 kg/h.

.2 Method: Hydroseed.

.2 In packages individually labelled in accordance with in accordance with Government of Canada "Seeds Act" and "Seeds Regulations" and indicating name of supplier.

2.2 WATER

.1 Free of impurities that would inhibit germination and growth.

.2 Supplied by Contractor.

2.3 FERTILIZER

.1 To Canada "Fertilizers Act" and Regulations.

.2 Complete synthetic fertilizer with guaranteed minimum analysis as specified.

2.4 COMPOSTED ORGANICS FOR TERRASEED

.1 Composted organics shall be premixed and shall consist of 100% composted materials. The composted organics may be amended.

.1 Amendments shall be added at the discretion of the Contractor to ensure the composted organics meets the material specification and is suited for distribution by a pneumatic blower.

.2 Once mixed, composted organic material shall consist of particles where 100% of the material is able to pass through a 25mm sieve.

2.5 COMPOST/ MULCH BLEND FOR TERRASEED

.1 Compost/mulch blend combined with a special organic soil tacifier additive constructed with a pneumatic blower to control and reduce soil erosion.

.2 Material must be applied using a pneumatic blower unit complete with a supplemental granular injection system capable of installing at least 15 cubic meters per hour

.3 Contractor must have minimum three (3) years proven experience in successful installation.

.4 Materials:

.1 The compost portion of the Blend shall be derived from well-decomposed organic matter source produced by controlled aerobic (biological) decomposition that has been sanitized through the generation of heat and stabilized to the point that it is appropriate for this particular application. Compost material shall be processed through proper thermophilic composting, meeting the Canadian Council of Ministers of the Environment’s (CCME) definition for a ‘process to further reduce

pathogens' (PFRP). The compost portion shall meet the chemical, physical and biological properties outlined below.

Parameters[1,4]	**Reported as (units of measure)**	**Blend to be Vegetated**
PH[2]	pH units	5.0 - 8.5
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5
Stability[3] Carbon Dioxide Evolution Rate	mg CO2-C per g OM per day	< 8
Physical Contaminants (man- made inerts)	%, dry weight basis	< 1

.2 Recommended test methodologies are provided in Test Methods for the Examination of Composting and Compost (SCC through BNQ)

.3 Each specific plant species requires a specific pH range. Each plant also has a salinity tolerance rating, and maximum tolerable quantities are known. When specifying the establishment of any plant or turf species, it is important to understand their pH and soluble salt requirements, and how they relate to the compost in use.

.4 Stability/Maturity rating is an area of compost science that is still evolving, and as such, other various test methods could be considered. Also, never base compost quality conclusions on the result of a single stability/maturity test.

.5 Departmental Representatives may modify the allowable compost specification ranges based on specific field conditions and plant requirements.

.2 Organic soil tackifier additive shall be injected into Blend material at time of construction.

.1 Blend shall be applied/injected at a minimum rate of 615 kg/ ha (or as specified by manufacturer), to be confirm by Departmental Representative.

.3 A proof of certification as a pneumatic terraseed installer shall be submitted to the Departmental Representative for approval prior to installation. Performance test results for terraseed blend with organic tacifier application shall be made available upon request.

.4 Where seeding or planting is planned, Terraseed blend material must meet supplier minimum specification requirements for seeding purposes.

2.6 EQUIPMENT FOR TERRASEED

.1 Pneumatic Blower Truck:

.1 Truck shall be a custom manufactured, full integrated, truck-mounted unit.

.2 Truck shall be equipped with a PLC-calibrated seed injection system and shall be capable of uniformly applying materials and seed at a rate greater than 0.25 cubic metres of material per minute.

.3 Truck shall be equipped with an application hose capable of extending 90 metres from the blower truck unit.

2.7 Execution

2.8 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for hydraulic seeding in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

2.9 INSTALLERS

.1 Use installer’s members in Good Standing of Ontario Horticultural Trades Association.

2.10 OPERATIONAL CONSTRAINTS

.1 The composted organics and seeding operation shall not commence until a legible, valid Seed Analysis Certificate and a legible, valid signed declaration from the compost supplier have been provided to the Departmental Representative.

.2 The composted organics and seeding operation shall not commence until the Departmental Representative has approved the surface preparation and the layout of permanent seed mixes.

.3 The composted organics and seeding application and/or re-application shall not be carried out under adverse field conditions such as high wind, frozen soil or soil covered with snow, ice or in areas of standing water or a concentrated flow of water.

.4 The surface to be seeded shall be prepared not more than 7 calendar days before the seeding operation.

2.11 PROTECTION OF EXISTING CONDITIONS

.1 Protect structures, signs, guide rails, fences, plant material, utilities and other surfaces not intended for spray.

.2 Immediately remove any material sprayed where not intended as directed by Consultant.

2.12 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.

.1 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 Consultant's approval of grade and topsoil depth before starting to seed.

2.13 SEEDING PERIOD

.1 Seed mix is to be applied on designated areas in late Fall, once the area has a hard frost but before the ground is frozen. Best results if seed mix is applied on designated areas mid to late November, or as indicated by seed supplier.

2.14 TERRASEEDING

.1 Application Rates for Composted Organics

.1 50mm minimum application

.2 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.

.3 For mechanical seeding:

.1 Apply seed and composted organics with pneumatic blower truck.

.2 Prior to the application of the composted organics and seeding, the Contractor shall ensure that the pneumatic blower has been properly calibrated to provide the specified amounts of seed and that the blower can uniformly apply composted topsoil and seed at a rate greater than 0.25 cubic metres of material per minute.

.3 Once the PLC has been calibrated, the Contractor shall apply composted organics and seeding uniformly at specified depths to all areas identified for cover in the contract drawings or as directed by the Consultant.

.4 On cultivated surfaces, sow seed uniformly at rate of:

.1 1kg/400m2 naturalized seed mixture.

.5 Blend applications 300mm into adjacent grass areas to form uniform surfaces.

2.15 WATERING

.1 Spring and summer seeding is to be water regularly during the first 4-6 weeks after planting.

.2 Water after 6 weeks only if prolonged dry periods occur.

.3 Always water in the early morning for 15 to 30 minutes

2.16 PREPARATION OF SLURRY

.1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Consultant. 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 materials are in seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

2.17 SLURRY APPLICATION

.1 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.

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

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

.3 Slurry mixture applied per hectare.

.1 Seed 4, 5, 6: mixture 3g/sq meter.

.4 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.

.5 Blend application 300 mm into adjacent grass areas or sodded area to form uniform surfaces.

.6 Re-apply where application is not uniform.

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

2.18 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.1 Clean and reinstate areas affected by Work.

2.19 PROTECTION

.1 Protect seeded areas from trespass until plants are established.

.2 Remove protection devices as directed by Consultant.

2.20 MAINTENANCE UNTIL ACCEPTANCE

.1 Ensure maintenance is carried out under supervision of certified Landscape Maintenance Supervisor.

.2 Perform following operations from time of seed application until acceptance by Consultant.

.3 Seed Mixtures:

.1 Water to ensure proper levels of moisture during the first four to six weeks after planting. Always water in the early morning. Control watering to prevent washouts.

.2 Water every other day for 15 minutes to half an hour, or just enough to keep the soil moist. Overwatering can be harmful, especially on heavy clay soils that retain moisture.

.3 Perennial wildflowers and grasses grow slowly, and weeds will likely grow much faster in the first two years. Weeds can be controlled by keeping them mowed back to a height of 4 - 6 inches the first year.

.4 Cut back weeds on a monthly basis in the first year of establishment is one of the most critical steps in the success of the wildflower planting. Expect to mow weeds about once a month in the first year. The actual mowing frequency will depend upon rainfall in any given year, and the actual weed density and height.

.5 At the end of the first season, do not mow down the year's growth. Leave it to help protect the young plants over the winter.

.6 In spring of the second year, the planting should be mowed right to the ground, and the cuttings raked off, if possible.

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

.8 Control weeds by mechanical or non-chemical means utilizing acceptable integrated pest management practices.

2.21 ON-GOING MAINTENANCE:

.1 Seed Mixes 1, 6 and 7:

.1 Yearly:

.1 Prune to 8” from ground once in early spring or late fall.

2.22 FINAL ACCEPTANCE

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

.1 Areas are uniformly established free of rutted, eroded, bare or dead spots and extent of weeds apparent in seed mix is acceptable.

.2 Areas have been cut at least twice.

.2 Areas seeded in fall which have not received two (2) cuts will be reviewed for acceptance the following spring one (1) month after the start of the growing season.

.3 Final acceptance will be after 1 full growing season.

2.23 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period.

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

.2 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.

.3 Control weeds by mechanical means.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 91 19.13 - Topsoil Placement and Grading

1.2 REFERENCES

.1 Canadian Nursery Landscape Association (CNLA)

.2 'Canadian Standards for Nursery Stock – Eighth Edition'.

.3 Government of Canada Department of Justice (GCDJ)

.1 F 10 'Fertilizers Act'.

.2 C.R.C., c. 666 'Fertilizers Regulations'

1.3 DELIVERY AND STORAGE

.1 Schedule the deliveries in order to keep storage at the job site to a minimum without causing delays.

.2 Deliver, unload, and store the sod on pallets.

.3 Deliver the sod to site within 24 hours of being lifted and lay within 36 hours of being lifted.

.4 Do not deliver small, irregular, or broken pieces of sod.

.5 During wet weather allow to dry sufficiently to prevent tearing during lifting and handling.

.6 During dry weather protect the sod from drying and water as necessary to ensure its vitality and prevent dropping of soil in handling. Any dry sod will be rejected.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:

.1 Schedule sod laying to coincide with preparation of soil surface.

.2 Schedule sod installation when frost is not present in ground.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements of seed mix, seed purity, and sod quality.

.3 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties of seed mix, seed purity, and sod quality.

Part 2 Products

2.1 MATERIALS

.1 Turfgrass Water Conservation Alliance (TWCA) approved Sod as supplied by Manderley 21 Concourse Gate, Ottawa, Ontario, K2E 7S4, Contact: Sean Moher, Manderlay (613) 225-7500 x 229 or approved equivalent.

.1 Sod Blend:

.1 29.67% Ridgeline Kentucky Bluegrass

.2 29.57% Monte Carlo Kentucky Bluegrass

.3 28.91% Mallard Kentucky Bluegrass

.4 9.88% Diva Kentucky Bluegrass

.5 1.97% Inert Matter (0% Weed Seed)

.2 Sod Quality:

.1 Drought tolerance: Data quantitatively measured over a two year span at multiple locations.

.2 Data results reviewed by 3rd party University Turfgrass Researcher.

.3 Approved cultivars to rank top statistical group for drought tolerance (staying green without adding additional water input).

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

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

.6 Mowing height limit: 35 to 65 mm.

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

.2 Sod establishment support:

.1 Wooden pegs: 17 x 8 x 200 mm.

.2 Biodegradable starch pegs: 17 x 8 x 200 mm.

.3 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 written approval from Consultant of sod at source.

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

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sod installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.1 Verify that grades are correct and prepared in accordance with Section 32 91 19.13 - Topsoil and Finish Grading. If discrepancies occur, notify Consultant and commence work when instructed by 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 elevations indicated, to tolerance of plus or minus 15mm for Commercial Grade Turf Grass Nursery Sod, 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 in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

3.3 SOD PLACEMENT

.1 Ensure sod placement is done under supervision of certified Landscape Planting Supervisor.

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

.3 Lay the sod in rows, perpendicular to slope, smooth, and even with adjoining areas, and with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements. The sod should be staked on slopes greater than 2.5:1.

.4 Roll sod as directed by Consultant. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

.5 Water the sod immediately after laying the sod to obtain moisture penetration through the sod into top 100 mm of topsoil.

.6 Provide adequate moisture protection of sodded areas against erosion and mechanical damage. Remove protection after lawn areas have been accepted.

3.4 SOD PLACEMENT ON SLOPES AND PEGGING

.1 Start laying sod at bottom of slopes.

.2 Peg sod on slopes steeper than 3 horizontal to 1 vertical, within 1 m of catch basins and within 1 m of drainage channels and ditches to following pattern:

.1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.

.2 Not less than 3-6 pegs per square metre.

.3 Not less than 6-9 pegs per square metre in drainage structures. Adjust pattern as directed by Consultant.

.4 Drive pegs to 20 mm above soil surface of sod sections.

3.5 FERTILIZING PROGRAM

.1 Fertilize during establishment and warranty periods to following program:

Date	Rate	Ratio
Two weeks after sodding	0.5 kg/ 100m2	2:1:1
Fall	0.5 kg/ 100m2	2:1:1
Spring	0.5 kg/ 100m2	2:1:1

3.6 PROTECTION BARRIERS

.1 Protect newly sodded areas from deterioration with snow fence on rigid frame as required to approval of Consultant.

.2 Remove protection 2 weeks after installation as directed by Consultant.

3.7 MAINTENANCE DURING ESTABLISHMENT PERIOD

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

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

.2 Cut grass to 60 mm when or prior to it reaching height of 90 mm.

.3 Maintain sodded areas weed free 95%.

.4 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.

.5 Temporary barriers or signage to be maintained where required to protect newly established sod.

3.8 ACCEPTANCE

.1 Sodded Commercial Grade Turf Grass Nursery Sod areas will be accepted by Consultant provided that:

.1 Sodded areas are properly established.

.2 Extent of surface soil visible when grass has been cut to height of 60 mm is acceptable.

.3 Sod is free of bare or dead spots and extent of weeds apparent in grass is acceptable.

.4 Sodded areas have been cut minimum 2 times prior to acceptance.

.5 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.

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

3.9 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period:

.1 Water sodded Turf Grass Nursery Sod areas at weekly intervals to obtain optimum soil moisture conditions to depth of 100 mm.

.2 Repair and resod dead or bare spots to satisfaction of Consultant.

.3 Cut grass and remove clippings that will smother grass as directed by Consultant to height as follows:

.1 Commercial Grade Turf Grass Nursery Sod :

.1 60 mm during normal growing conditions.

.2 Cut grass at 2 week intervals or as directed by Consultant but at intervals so that approximately one third of growth is removed in single cut.

.3 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.

.4 Eliminate weeds by mechanical means to extent acceptable to Consultant.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 91 19 13 – Topsoil Placement and Grading.

.2 Section 32 94 14 – Plant Warranty and Maintenance.

1.2 REFERENCES

.1 Definitions:

.1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

.2 Reference Standards:

.1 Agriculture and Agri-Food Canada (AAFC).

.1 Plant Hardiness Zones in Canada-2000.

.2 Canadian Nursery Landscape Association (CNLA)

.1 Canadian Standards for Nursery Stock-2001.

.3 Hydro Ottawa Limited Tree Planting Advice Brochure.

.4 Sizing, grading, quality and preparation of the trees, shrubs, ground covers and all other plantings shall comply with the latest edition of the Canadian Nursery Trades Association Metric Guide for Nursery Stock grown in Zone 4 or higher in accordance with Agriculture Canada Plant hardiness Zone Map.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling: obtain approval from Consultant of schedule 7 days in advance of shipment of plant material.

.2 Schedule to include:

.1 Quantity and type of plant material.

.2 Shipping dates.

.3 Arrival dates on site.

.4 Planting Dates.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for trees, shrubs, ground cover, fertilizer, mycorrhiza, anti-desiccant, anchoring equipment, and mulch and include

product characteristics, performance criteria, physical size, finish and limitations.

.2 Provide product data for:

.1 Fertilizer

.2 Anti-desiccant

.3 Bio-degradable Tree Support Tape.

.4 Mulch

.3 Samples:

.1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

.2 Provide samples for:

.1 Mulch

.2 Staking Material

.3 Mycorrhiza

.4 Certification of plant hardiness zones from supply nursery.

.4 Sustainable Design Submittals:

.1 LEED Canada-NC Version 1.0 Submittals: in accordance with Section 01 35 21 - LEED Requirements.

.2 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with Section 01 35 21 - LEED Requirements.

.3 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50 to 75% of construction wastes were recycled or salvaged.

.4 Regional Materials: submit evidence that project incorporates required percentage 10 to 20% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

1.5 DELIVERY, STORAGE, PROTECTION AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

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

.2 Protect plant material from damage during transportation:

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

.2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, 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.

.3 Storage and Handling Requirements:

.1 Immediately store and protect plant material, which will not be installed within 1 hour in accordance with supplier's written recommendations and after arrival at site in storage location approved by Consultant.

.2 Protect stored plant material from frost, wind and sun and 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. Heel-in fibre pots.

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

.3 Store and manage hazardous materials in accordance with manufacturer's written instructions.

.4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 35 21 - LEED Requirements.

.5 Packaging Waste Management: remove for reuse of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.6 SCHEDULING

.1 Obtain approval from Representative of schedule 7 days in advance of shipment of plant material.

.2 Schedule to include:

.1 Quantity and type of plant material.

.2 Shipping dates.

.3 Arrival dates on site.

.4 Planting Dates.

1.7 WARRANTY

.1 Acceptance of the planting will be issued by Representative upon the satisfactory installation of all plant material at substantial completion of the contract.

.2 The Warranty Period starts upon issuance of notice of acceptance and continues for a period of 2 years.

.3 End-of-warranty inspection will be conducted by Representative.

.4 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.

Part 2 Products

2.1 PLANT MATERIAL

.1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.

.1 Source of plant material: grown in Zone 3 to 4 in accordance with Plant Hardiness Zones in Canada.

.2 Plant material must be planted in zone specified as appropriate for its species.

.3 Plant material in location appropriate for its species.

.2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

.3 Trees: with straight trunks, well and characteristically branched for species.

.4 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.

.5 Smaller nursery stock than what is specified will not be approved.

2.2 WATER

.1 Free of impurities that would inhibit plant growth.

2.3 STAKES

.1 All trees will be staked with 50 x 50 x 2400mm Eastern White Cedar stakes.

2.4 TREE TIE SYSTEM

.1 Tree Tie by Lee Valley Toos Ltd or equivalent.

.2 Local Supplier Contact: Lee Valley Tools Ltd. P.O. Box 6295, Station J, Ottawa, ON K2A 1T4

.3 Product name: Arbor Tape – 100' Roll.

2.5 TRUNK PROTECTION

.1 Burlap: clean 2.5 kg/m^2 minimum mass and 150 mm minimum wide, and twine fastener.

2.6 MULCH

.1 Bark chip: varying in size from 25 to 50 mm in diameter, from bark of coniferous trees.

.2 Mulch shall be not be placed immediately adjacent to tree trunks, but shall be kept at least 3" from root collar at the soil line

.3 All planting areas must be completely mulched with a layer of organic hardwood mulch: 75 mm minimum, natural colour, shredded hardwood type organic type mulch from healthy trees free of chemical residues, insects and fungi and and suitable as a top dressing of trees and shrubs. Sawdust is not acceptable.

2.7 FERTILIZER

.1 Synthetic commercial type as recommended by soil test report.

.1 Ensure new root growth is in contact with mycorrhiza.

.2 Use mycorrhiza as recommended by manufacturer's written recommendations.

2.8 ANTI-DESICCANT

.1 Wax-like emulsion.

2.9 SOURCE QUALITY CONTROL

.1 Obtain approval Consultant of plant material prior to planting.

.2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for planting installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 PRE-PLANTING PREPARATION

.1 Proceed only after receipt of written acceptability of plant material from Consultant.

.2 Remove damaged roots and branches from plant material.

.3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

.4 Locate and protect utility lines.

.5 Notify and acquire written acknowledgment from utility authorities before beginning excavation of planting pits for trees and shrubs.

.6 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS

.1 Establishment of sub-grade for planting beds in accordance with Section 31 22 13 - Rough Grading.

.2 Preparation of planting beds in accordance with Section 32 91 19.13 - Topsoil Placement and Grading.

.3 For individual planting holes:

.1 Stake out location and obtain approval from Consultant prior to excavating.

.2 Excavate to depth and width as indicated.

.3 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.

.4 Scarify sides of planting hole.

.5 Remove water which enters excavations prior to planting. Notify Consultant if water source is ground water.

3.4 PLANTING

.1 For bare root stock, place 50 mm backfill soil in bottom of hole.

.1 Plant trees and shrubs with roots placed straight out in hole.

.2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball.

.1 Do not pull burlap or rope from under root ball.

.3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.

.4 Plant vertically in locations as indicated.

.1 Orient plant material to give best appearance in relation to structure, roads and walks.

.5 For trees and shrubs:

.1 Backfill soil in 150 mm lifts.

.1 Tamp each lift to eliminate air pockets.

.2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.

.3 After water has penetrated into soil, backfill to finish grade.

.2 Form watering saucer as indicated.

.6 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.

.7 Water plant material thoroughly.

.8 After soil settlement has occurred, fill with soil to finish grade.

3.5 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees as indicated.

.2 Install trunk protection before installation of tree supports.

3.6 TREE SUPPORTS

.1 All trees will be staked with Arbor Tape or approved equal as per the tree planting detail provided in the drawing package.
NOTE: Guying wire is not acceptable for staking plant material and will not be approved by the Representative.

.2 To tie the tree ties:

.1 Fix end of tree tie to timber tree stake using 2 galvanized staples or large headed clout nails. Loop the tree tie once around the stake.

.2 Bring the roll around the tree and loop around the tree and stake a couple of time until taught.

.3 Form a firm spacer between stake and tree by wrapping the tree tie over and under the existing loop. The tree tie will be quite tight against the tree to allow for the fabric to stretch.

.4 Bring the roll around tree and back toward the timber stake. Finish the spacer by wrapping the tree tie over and under the existing loop, tight to the stake. Finish tie by nailing 2 staples or large headed clout nails through the tree tie into the stake.

.5 After tree supports have been installed remove broken branches with clean, sharp tools.

3.7 MULCHING

.1 Ensure soil settlement has been corrected prior to mulching.

.2 Spread mulch as indicated.

3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following maintenance operations from time of planting to acceptance Consultant.

.1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.

.1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.

.2 Remove weeds monthly.

.3 Replace or respread damaged, missing or disturbed mulch.

.4 For non-mulched areas, cultivate as required to keep top layer of soil friable.

.5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Representative prior to application.

.6 Remove dead or broken branches from plant material.

.7 Keep trunk protection and guy wires in proper repair and adjustment.

.8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.9 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by Consultant to end of warranty period, perform following maintenance operations.

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Reform damaged watering saucers.

.3 Remove weeds monthly.

.4 Replace or respread damaged, missing or disturbed mulch.

.5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.

.6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Representative prior to application.

.7 Apply fertilizer in early spring as indicated by soil test.

.8 Remove dead, broken or hazardous branches from plant material.

.9 Keep trunk protection and tree supports in proper repair and adjustment.

.10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.

.11 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

.12 Submit monthly written reports to Representative identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

3.10 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.2 Divert discarded burlap, wire and plastic plant containers materials from landfill to plastic recycling facility approved by Consultant.

.3 Dispose of unused fertilizer at official hazardous material collection site approved by Consultant.

.4 Dispose of unused anti-desiccant at official hazardous material collections site approved by Consultant.

.5 Divert unused wood and mulch materials from landfill to recycling facility approved by Consultant.

3.11 CLOSEOUT ACTIVITIES

.1 Submit maintenance reports for trees, shrubs, and other plantings.

3.12 MAINTENANCE DURING WARRANTY PERIOD

.1 Refer to Section 32 94 14 for Plant Warranty & Maintenance.

END OF SECTION

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 The Contractor will provide maintenance and warranty of all installed plant material in accordance with this Special Provision.

1.2 RELATED SECTIONS

.1 Section 32 01 90 33 – Tree and Shrub Preservation.
.2 Section 32 91 21 – Topsoil and Finish Grading
.3 Section 32 93 10 – Trees, Shrubs and Groundcover Planting

1.3 DURATION

.1 The duration of the maintenance and warranty phase will be a **2 year period** following the date of Substantial Completion of the selected items of this contract. Refer to maintenance for requirements needed during the two (2) year period on plant material.

1.4 MAINTENANCE

.1 The Contractor will ensure that all plant material is maintained by using good horticulturally acceptable practices, and in a manner that is acceptable to the Representative.
.2 This will include adequate watering, pruning, fertilizing, control of weeds and grasses in all wood chip mulched areas, application of rodent repellent, attention to stakes, ties, rodent guards, wire and hose and subsequent removal of stakes, ties, wire and hose at the end of the maintenance period, pesticides, the wrapping and unwrapping of all coniferous trees for winter protection and any miscellaneous work to ensure the establishment of the plant material.
.3 The maintenance is to be followed throughout the two (2) year warranty period upon final acceptance of the Consultant.

Part 2 PRODUCTS

2.1 SOURCE QUALITY CONTROL

.1 Obtain approval from Consultant of any new plant material at source prior to planting.
.2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

Part 3 EXECUTION

3.1 WATERING

.1 The Contractor will ensure that all plant material receives adequate water for the duration of the maintenance and warranty period. A monitoring program by the Contractor to determine required watering accomplishes this.

.2 Watering will not be carried out between the hours of 10:00 a.m. and 3:00 p.m. The applied water temperature will be a maximum of 10ºc below the ambient air temperature.

.3 The Contractor will inspect all the beds after four days without precipitation and subsequently every two days until rainfall, to ensure the soil is moist and friable. Water as required to ensure a minimum moisture penetration of 300 mm.

3.2 PRUNING

.1 Caliper Trees: pruning will occur only during the dormant period. Ensure all cuts are smooth and clean. Painting of cuts is not allowed. Do no damage the bark collar at the base of branches. Remove all dead or broken branches from the site.

.2 Tree Whips and Shrubs: pruning will occur as required to remove all dead or broken branches.

3.3 INFESTATION

.1 Monitor plant material throughout the year for any disease, insect or rodent damage.

.2 Ensure prompt treatment of any damage. If application of pesticide is required, submit product information and ratio for approval to Representative. Protect plant material from any potential damage.

.3 Spray plants to combat pests and diseases. D.D.T. is not to be used. The Ontario Ministry of Transportation and the Ontario Ministry of the Environment, prior to being used, must approve any chemicals. All Personnel must be licensed in order to apply any sprays.

3.4 STAKES AND TIES

.1 Ensure all stakes are secure and ties are kept taut.

.2 Remove all stakes and ties after the **two-year maintenance period**, prior to final inspection.

3.5 FERTILIZING

.1 Monitor all plant material for vigorous growth. If application of fertilizer is deemed necessary, prior to the application, submit ratio and application rate to Representative for approval.

3.6 WINTER PROTECTION

.1 Coniferous Wrap: Provide 4 wood stakes at dripline distance from the base of the tree. Wrap tree with wrapping material for winter protection. Material will be new burlap, at least 270 g/m^2 in weight supplied in 1.0 metre wide or 1.5 metres wide rolls. Wrap horizontally around tree and stakes, secure as approved by Representative.

.2 Completely wrap all coniferous trees each fall, prior to the first major snowfall. Monitor the wrapping throughout the winter, and repair as required.

.3 Miscellaneous: complete all miscellaneous maintenance to protect the plant material during the winter, including watering, as required.

3.7 MISCELLANEOUS

.1 The Contractor will perform incidental maintenance on a biweekly basis during the growing season to ensure healthy plant growth and a satisfactory appearance of planting beds and plant materials including the removal of weeds and topping of mulch.

Part 4 INSPECTIONS

4.1 QUALITY OF INSPECTIONS

.1 The Representative will inspect all plant material until the end of the maintenance and warranty period. Inspections will include all original and replacement material.

.2 Notwithstanding periodic inspections throughout the maintenance period, regularly scheduled inspections will be held to determine replacements. Inspections will be held each April and September during the warranty period to identify replacement quantities. The Representative will notify the Contractor in writing of all plant material requiring replacement.

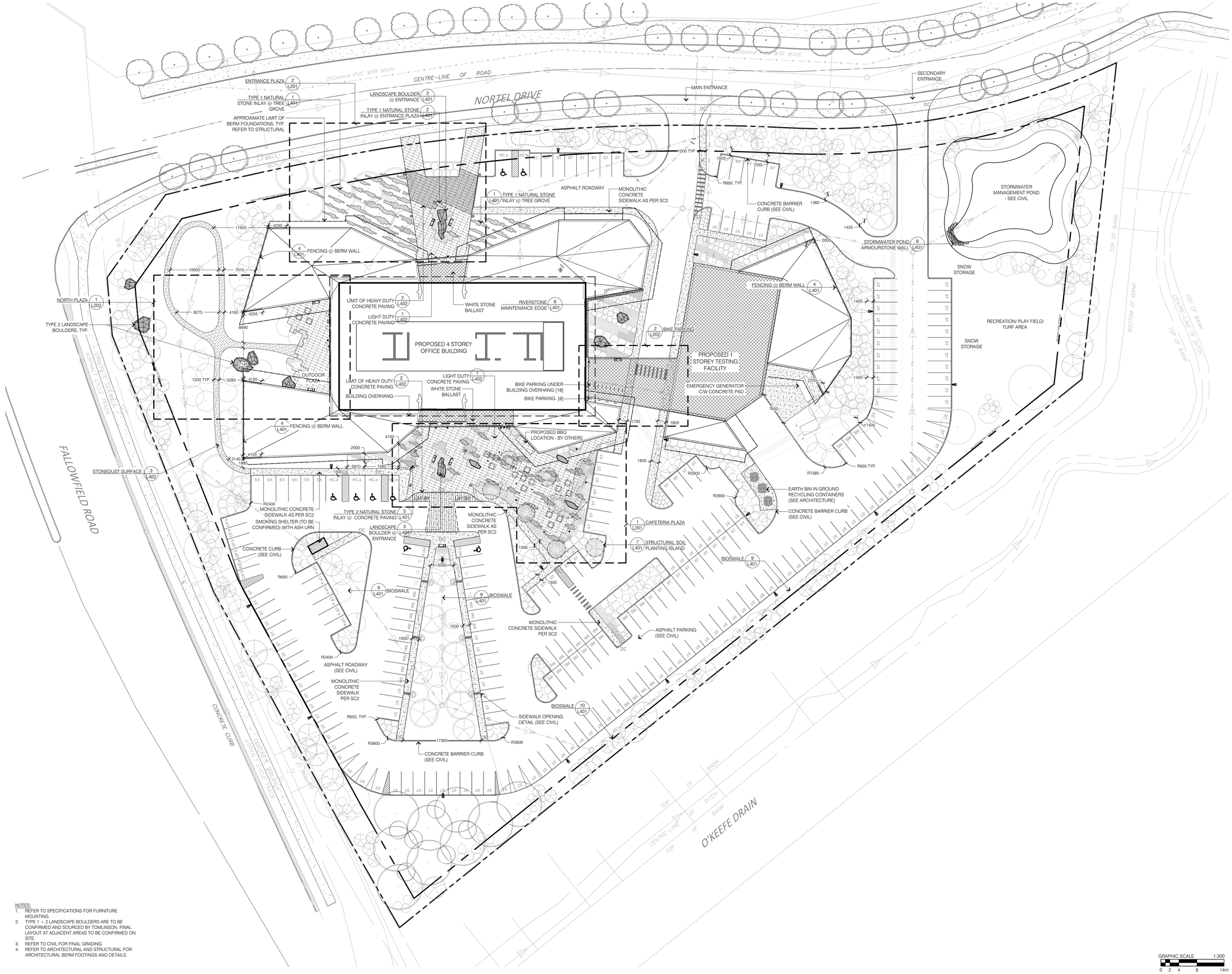
.3 All maintenance activities will be monitored by the Representative to ensure the survival and growth of the plant material and conformance with this Special Provision.

.4 The contractor will submit a **monthly report** of maintenance activities.

4.2 REPLACEMENT

.1 Units of plant material that are unacceptable will be replaced by the Contractor in accordance with the Construction Specification for Nursery Stock of this contract.

END OF SECTION



NOTES:
1. REFER TO SPECIFICATIONS FOR FURNITURE MOUNTING.
2. TYPE 1 + 2 LANDSCAPE BOULDERS ARE TO BE CONFIRMED AND SOURCED BY TOMLINSON. FINAL LAYOUT AT ADJACENT AREAS TO BE CONFIRMED ON SITE.
3. REFER TO CIVIL FOR FINAL GRADING.
4. REFER TO ARCHITECTURAL AND STRUCTURAL FOR ARCHITECTURAL BERM FOOTINGS AND DETAILS.

GENERAL NOTES

1. ALL GENERAL SITE INFORMATION AND CONDITIONS COMPILED FROM ARCHITECTS AND ENGINEERS PLANS AND SURVEYS PROVIDED IN DIGITAL FORMAT OCTOBER 2015.
2. DO NOT SCALE THIS DRAWING.
3. REPORT ANY DISCREPANCIES PRIOR TO COMMENCING WORK. NO RESPONSIBILITY IS BORN BY THE LANDSCAPE ARCHITECT FOR UNKNOWN SUBSURFACE CONDITIONS.
4. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY ERRORS AND/OR OMISSIONS TO THE LANDSCAPE ARCHITECT.
5. REINSTATE ALL AREAS AND ITEMS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT.
6. CONTRACTOR TO LAYOUT PLANTING BEDS, PATHWAYS ETC. TO APPROVAL OF LANDSCAPE ARCHITECT PRIOR TO ANY EXCAVATION.
7. DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY LANDSCAPE ARCHITECT AS ISSUED FOR CONSTRUCTION.
8. THE ACCURACY OF THE POSITION OF UTILITIES IS NOT GUARANTEED.
9. INDIVIDUAL UTILITY CO. MUST BE CONTACTED FOR CONFIRMATION OF UTILITY EXISTENCE AND LOCATION PRIOR TO DIGGING.
10. THIS DRAWING IS AN INSTRUMENT OF SERVICE AND REQUIRES THE PERMISSION OF THE LANDSCAPE ARCHITECT FOR USE. COPYRIGHT IS RESERVED BY THE LANDSCAPE ARCHITECT, DAVID M. LASHLEY.

LEGEND:

- PROPERTY LINE
- SETBACK
- LOT LINE
- CONCRETE BARRIER CURB
- DEPRESSED CURB
- STORM SEWER
- SANITARY SEWER
- WATER/SEWER
- BERM FOUNDATION LIMIT
- NEW LANDSCAPE CATCH BASIN
- NEW DITCH INLET CATCHBASIN (DICB)
- NEW CATCHBASIN MANHOLE
- NEW SIAMESE CONNECTION
- EXISTING FIRE HYDRANT
- NEW FIRE HYDRANT
- NEW EXTERIOR LIGHT STANDARDS
- PEDESTRIAN LIGHTING, SEE ELECTRICAL
- BOLLARD LIGHTING, SEE ELECTRICAL
- TYPE 1 CONCRETE SURFACE - LIGHT DUTY
- TYPE 1 CONCRETE SURFACE - HEAVY DUTY
- TYPE 2 CONCRETE SURFACE - LIGHT DUTY - BY TOMLINSON
- TYPE 2 CONCRETE SURFACE - HEAVY DUTY - BY TOMLINSON
- STONEDUST PATH
- RIVERSTONE MAINTENANCE EDGE
- LINE PAINTING - BY TOMLINSON
- WHITE STONE BALLAST
- TYPE 1 NATURAL STONE INLAY
- TYPE 2 NATURAL STONE INLAY
- LIMIT OF STRUCTURAL SOIL BELOW
- GUARD FENCE AT BERM WALL
- ZEBRA CROSSING LINE PAINTING - BY TOMLINSON
- UA STALL LINE PAINTING - BY TOMLINSON
- LANDSCAPE BOULDER
- HORIZONTAL BIKE PARKING (1.8x0.6m)
- BENCH
- WASTE RECEPTACLE
- FREESTANDING TABLE AND CHAIRS LOCATION TO BE DETERMINED ON SITE
- PROPOSED STREET TREES (BY CITY)
- NEW TREES
- NEW SHRUBS

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02	13.04.2016	REVISED SITE PLAN APPLICATION
01	18.12.2015	ISSUED FOR SITE PLAN APPLICATION

SEAL: ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS — JANNA BISNER — MEMBER

PROJECT NORTH:

TOMLINSON — FOUNDED ON STRENGTH GUIDED BY VISION

LASHLEY +ASSOCIATES
LANDSCAPE ARCHITECTURE AND SITE ENGINEERING
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OTTAWA, ON K1Y 3E6
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E Mail@LashleyLA.com

PROJECT:
TOMLINSON
NEW BUILDING
4501 STRANDHERD DRIVE

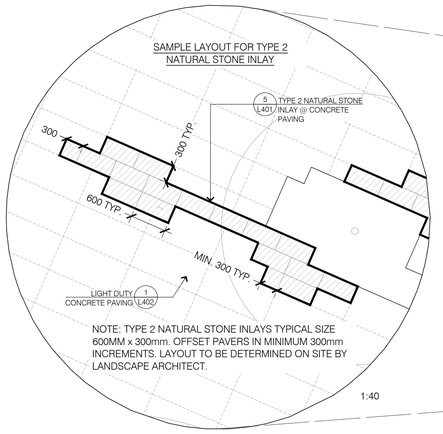
DRAWING TITLE:
LANDSCAPE SITE PLAN

GRAPHIC SCALE 1:300
0 2 4 8 14m

DATE:	10/8/2015
SCALE:	AS INDICATED
DRAWN BY:	MS
JOB No:	LA 15610-1

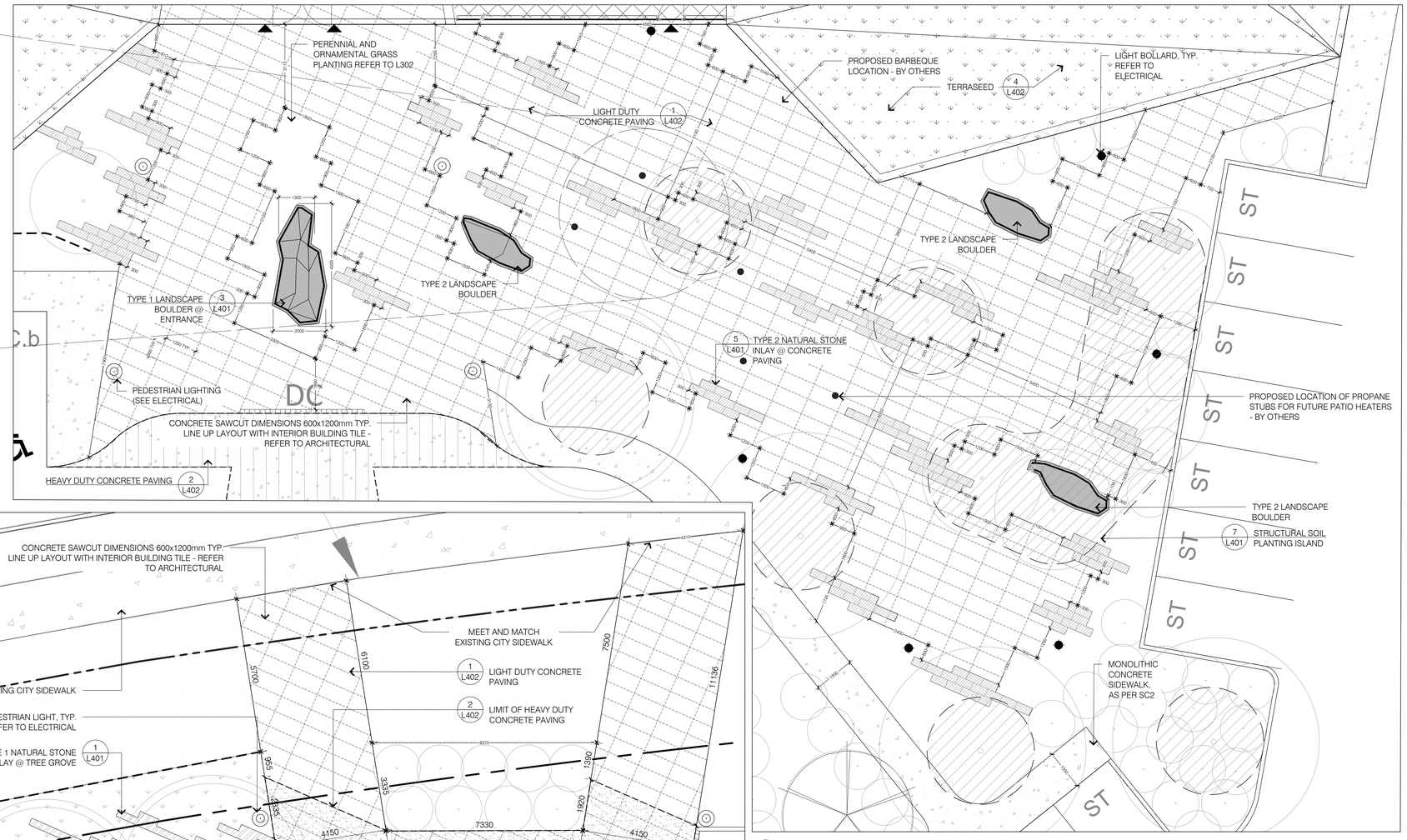
DRAWING No: L101

SAMPLE LAYOUT FOR TYPE 2 NATURAL STONE INLAY



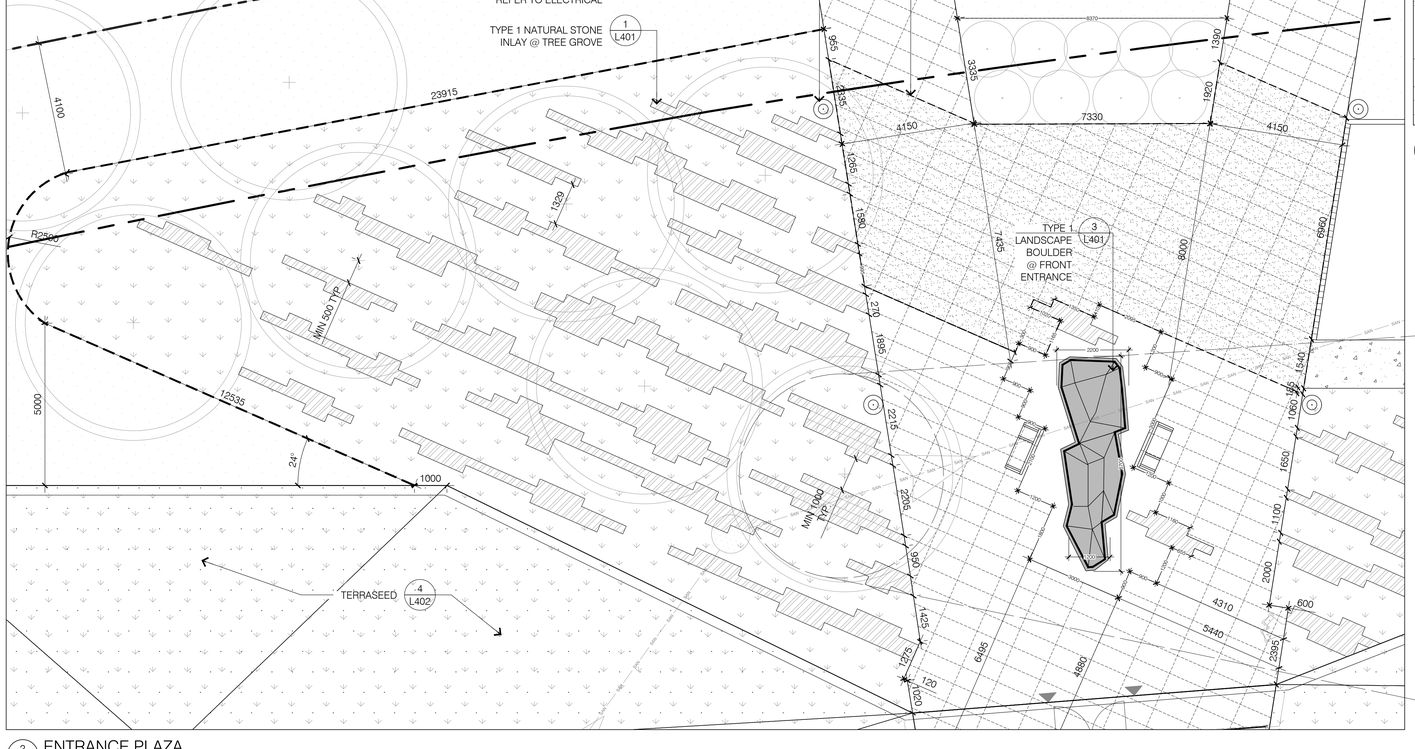
NOTE: TYPE 2 NATURAL STONE INLAYS TYPICAL SIZE 600MM x 300mm. OFFSET PAVERS IN MINIMUM 300mm INCREMENTS. LAYOUT TO BE DETERMINED ON SITE BY LANDSCAPE ARCHITECT.

1:40



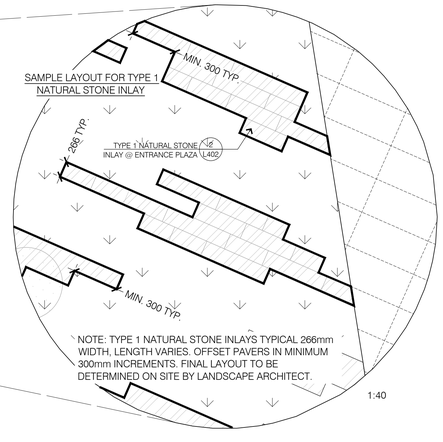
1 L201 CAFETERIA PLAZA

1:75



2 L201 ENTRANCE PLAZA

1:75



NOTE: TYPE 1 NATURAL STONE INLAYS TYPICAL 266mm WIDTH, LENGTH VARIES. OFFSET PAVERS IN MINIMUM 300mm INCREMENTS. FINAL LAYOUT TO BE DETERMINED ON SITE BY LANDSCAPE ARCHITECT.

1:40

NOTES:
1. REFER TO SPECIFICATIONS FOR FURNITURE MOUNTING.
2. TYPE 1 + 2 LANDSCAPE BOULDERS ARE TO BE CONFIRMED AND SOURCED BY TOMLINSON. FINAL LAYOUT AT ADJACENT AREAS TO BE CONFIRMED ON SITE.
3. REFER TO CIVIL FOR FINAL GRADING.
4. REFER TO ARCHITECTURAL AND STRUCTURAL FOR ARCHITECTURAL BERM FOOTINGS AND DETAILS.

GENERAL NOTES

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5. REINSTATE ALL AREAS AND ITEMS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT.
6. CONTRACTOR TO LAYOUT PLANTING BEDS, PATHWAYS ETC. TO APPROVAL OF LANDSCAPE ARCHITECT PRIOR TO ANY EXCAVATION.
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9. INDIVIDUAL UTILITY CO. MUST BE CONTACTED FOR CONFIRMATION OF UTILITY EXISTENCE AND LOCATION PRIOR TO DIGGING.
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LEGEND:

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- SETBACK
- LOT LINE
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- DEPRESSED CURB
- STORM SEWER
- SANITARY SEWER
- WATER/SEWER
- BERM FOUNDATION LIMIT
- NEW LANDSCAPE CATCH BASIN
- NEW DITCH INLET CATCHBASIN (DICB)
- NEW CATCHBASIN MANHOLE
- NEW SIAMESE CONNECTION
- EXISTING FIRE HYDRANT
- NEW FIRE HYDRANT
- NEW EXTERIOR LIGHT STANDARDS
- PEDESTRIAN LIGHTING, SEE ELECTRICAL
- BOLLARD LIGHTING, SEE ELECTRICAL
- PROPANE STUBS - BY OTHERS
- TYPE 1 CONCRETE SURFACE - LIGHT DUTY
- TYPE 1 CONCRETE SURFACE - HEAVY DUTY
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SEAL: ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS — MARINA SINGER — OALA — Member — Membre

PROJECT NORTH: N

TOMLINSON tomlinsongroup.com FOUNDED ON STRENGTH GUIDED BY VISION

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PROJECT:
TOMLINSON
NEW BUILDING
4501 STRANDHERD DRIVE

DRAWING TITLE:
LANDSCAPE PLAN DETAILS

DATE:	10/8/2015
SCALE:	AS INDICATED
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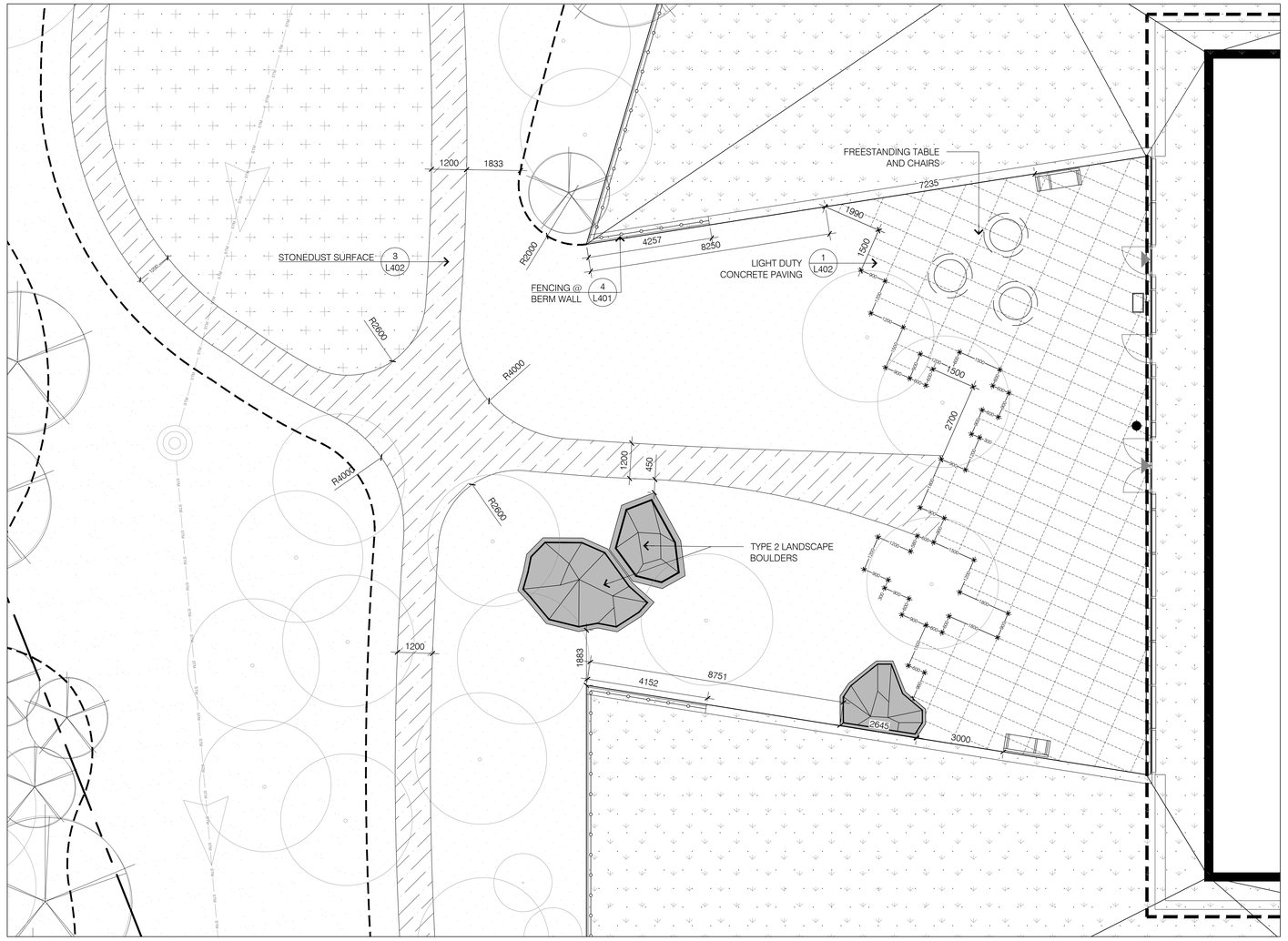
JOB No:	LA 15610-1

DRAWING No: L201



1 L202 NORTH PLAZA

1:75

NOTES:
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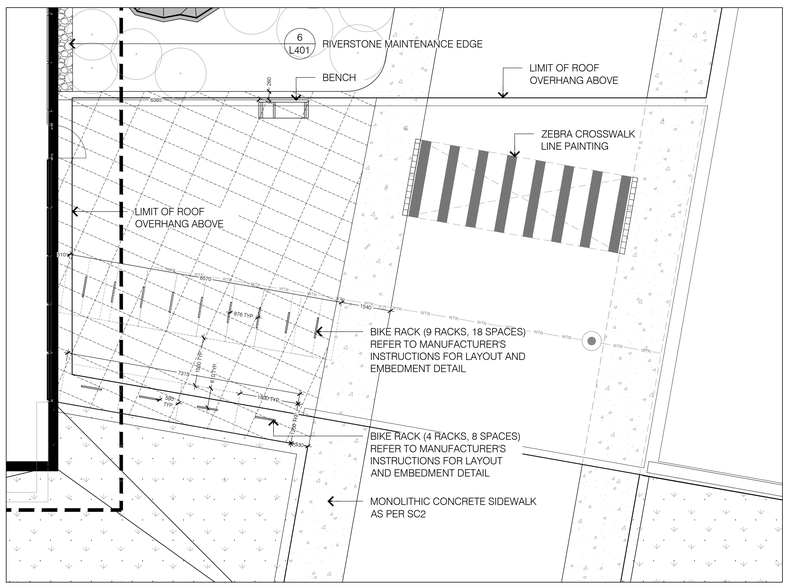

2 L202 BIKE PARKING

1:75

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PROJECT NORTH:

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PROJECT:

TOMLINSON
NEW BUILDING
4501 STRANDHERD DRIVE

DRAWING TITLE:

LANDSCAPE PLAN DETAILS 2

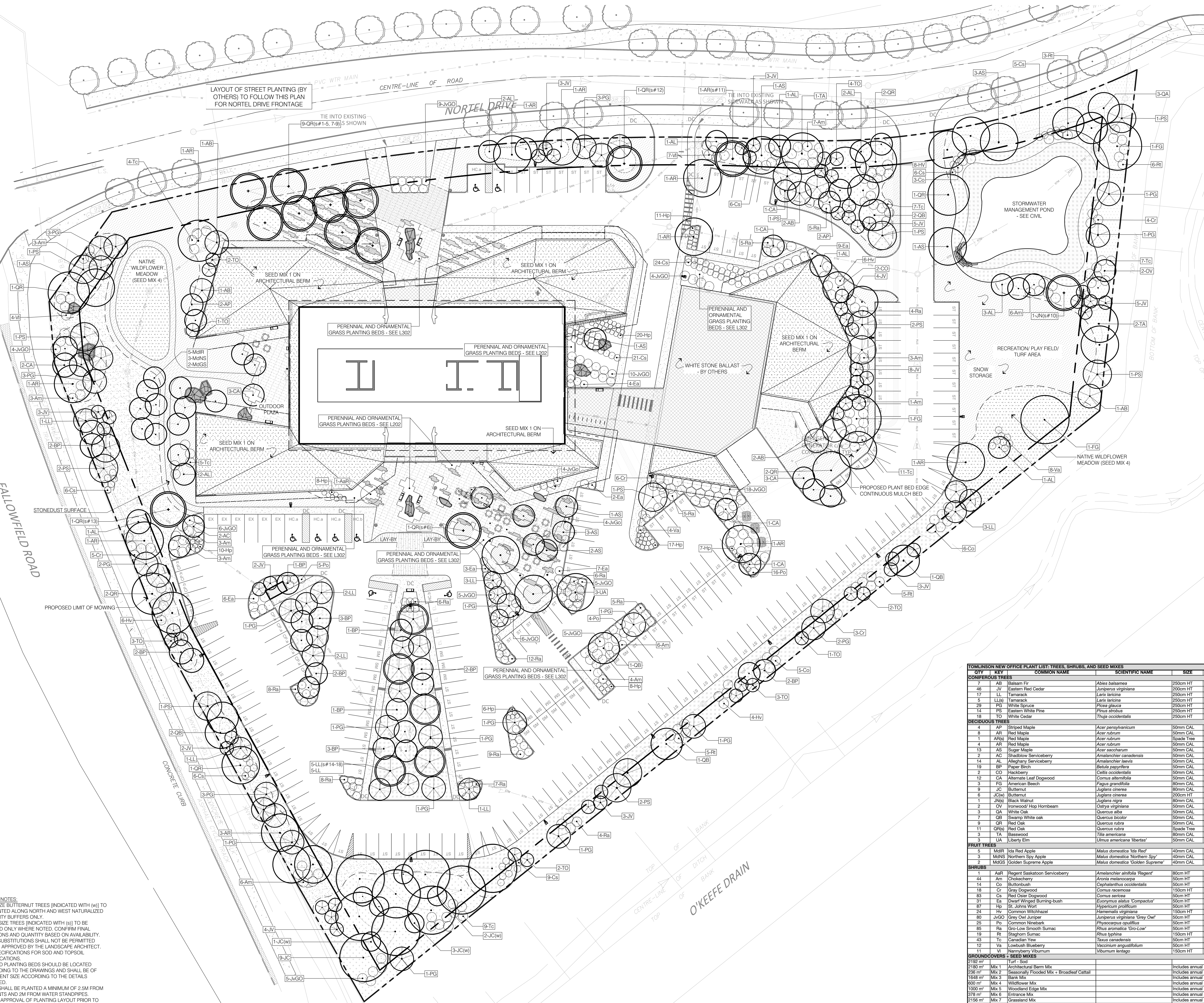
DATE:	10/8/2015
SCALE:	AS INDICATED
DRAWN BY:	MS
JOB No:	LA 15610-1

DRAWING No: L202

LAYOUT: L301 – PLANTING PLAN T-S-SM

PLOT DATE 8/25/2017

\\Mac\Projects\2000 +\2010 +\15610-1 Tomlinson Headquarters\5.0 WORKING DRAWINGS\100% IFC\15610-1 Tomlinson90% – Standard\15610-1_Tomlinson_Landscape_IFC_25-08-17.dwg



GRAPHIC SCALE 1:300

0 2 4 8 14m

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- NEW TREES
- NEW SHRUBS
- PERENNIALS + ORNAMENTAL GRASSES

SEED MIXES + GROUNDCOVERS

- TURF - SOD
- MIX 1: ARCHITECTURAL BERM MIX
- MIX 2: SEASONALLY FLOODED
- MIX 3: BANK MIX
- MIX 4: WILDFLOWER MIX
- MIX 5: WOODLAND EDGE MIX
- MIX 6: ENTRANCE MIX
- MIX 7: GRASSLAND MIX

TOMLINSON NEW OFFICE PLANT LIST: TREES, SHRUBS, AND SEED MIXES

QTY	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	COMMENT	SPACING
CONIFEROUS TREES						
7	AB	Balsam Fir	*Abies balsamea*	250cm HT	W.B., B&B	
46	JV	Eastern Red Cedar	*Juniperus virginiana*	200cm HT	W.B., B&B	
17	LL	Tamarack	*Larix laricina*	250cm HT	W.B., B&B	
5	LL(s)	Tamarack	*Larix laricina*	250cm HT	W.B., B&B	
29	PG	White Spruce	*Picea glauca*	250cm HT	W.B., B&B	
14	PS	Eastern White Pine	*Pinus strobus*	250cm HT	W.B., B&B	
18	TO	White Cedar	*Thuja occidentalis*	250cm HT	W.B., B&B	
DECIDUOUS TREES						
4	AP	Striped Maple	*Acer pensylvanicum*	50mm CAL	W.B., B&B	
8	AR	Red Maple	*Acer rubrum*	50mm CAL	W.B., B&B	
1	AR(s)	Red Maple	*Acer rubrum*	Spade Tree	Spaded	
4	AR	Red Maple	*Acer rubrum*	50mm CAL	W.B., B&B	
13	AS	Sugar Maple	*Acer saccharum*	50mm CAL	W.B., B&B	
2	AC	Shadblow Serviceberry	*Amalanchier canadensis*	50mm CAL	W.B., B&B	
14	AL	Alleghany Serviceberry	*Amalanchier laevis*	50mm CAL	W.B., B&B Multistem	
19	BP	Paper Birch	*Betula papyrifera*	50mm CAL	W.B., B&B Multistem	
2	CO	Hackberry	*Celtis occidentalis*	50mm CAL	W.B., B&B	
12	CA	Alternate Leaf Dogwood	*Cornus alternifolia*	50mm CAL	W.B., B&B	
3	FG	American Beech	*Fagus grandifolia*	80mm CAL	W.B., B&B	
9	JC	Butternut	*Juglans cinerea*	80mm CAL	W.B., B&B	
6	JC(w)	Butternut	*Juglans cinerea*	200cm HT	Potted, whip	
1	JN(s)	Black Walnut	*Juglans nigra*	80mm CAL	Spaded	
2	OV	Ironwood/ Hop Hornbeam	*Ostrya virginiana*	50mm CAL	W.B., B&B	
3	QA	White Oak	*Quercus alba*	50mm CAL	W.B., B&B	
7	QB	Swamp White oak	*Quercus bicolor*	50mm CAL	W.B., B&B	
9	QR	Red Oak	*Quercus rubra*	50mm CAL	W.B., B&B	
11	QR(s)	Red Oak	*Quercus rubra*	Spade Tree	Spaded	
3	TA	Basswood	*Tilia americana*	80mm CAL	W.B., B&B	
3	UA	Liberty Elm	*Ulmus americana 'libertas'*	50mm CAL	W.B., B&B	
FRUIT TREES						
5	MdIR	Ida Red Apple	*Malus domestica 'Ida Red'*	40mm CAL	W.B., B&B	
3	MdNS	Northern Spy Apple	*Malus domestica 'Northern Spy'*	40mm CAL	W.B., B&B	
2	MdGS	Golden Supreme Apple	*Malus domestica 'Golden Supreme'*	40mm CAL	W.B., B&B	
SHRUBS						
1	AaR	Regent Saskatoon Serviceberry	*Amelanchier alnifolia 'Regent'*	80cm HT	Potted	
44	Am	Chokecherry	*Aronia melanocarpa*	50cm HT	Potted	
14	Co	Buttonbush	*Cephalanthus occidentalis*	50cm HT	Potted	
18	Cr	Gray Dogwood	*Cornus racemosa*	150cm HT	W.B., B&B	
83	Cs	Red Osier Dogwood	*Cornus sericea*	50cm HT	Potted	
31	Ea	Dwarf Winged Burning-bush	*Euonymus alatus 'Compactus'*	50cm HT	Potted	
87	Hp	St. Johns Wort	*Hypericum prolificum*	50cm HT	Potted	
24	Hv	Common Witchhazel	*Hamemalis virginiana*	150cm HT	W.B., B&B	
80	JvGO	Grey Owl Juniper	*Juniperus virginiana 'Grey Owl'*	50cm HT	Potted	
25	Po	Common Ninebark	*Physocarpus opuliflius*	50cm HT	Potted	
85	Ra	Gro-Low Smooth Sumac	*Rhus aromatica 'Gro-Low'*	50cm HT	Potted	
19	Rt	Staghorn Sumac	*Rhus typhina*	150cm HT	W.B., B&B	
43	Tc	Canadian Yew	*Taxus canadensis*	50cm HT	Potted	
12	Va	Lowbush Blueberry	*Vaccinium angustifolium*	50cm HT	Potted	
11	Vl	Nannyberry Viburnum	*Viburnum lentago*	150cm HT	W.B., B&B	
GROUNDCOVERS + SEED MIXES						
2192 m^2		Turf - Sod				
2180 m^2	Mix 1	Architectural Berm Mix		Includes annual rye nurse crop		
236 m^2	Mix 2	Seasonally Flooded Mix + Broadleaf Cattail		Includes annual rye nurse crop		
1648 m^2	Mix 3	Bank Mix		Includes annual rye nurse crop		
600 m^2	Mix 4	Wildflower Mix		Includes annual rye nurse crop		
1000 m^2	Mix 5	Woodland Edge Mix		Includes annual rye nurse crop		
378 m^2	Mix 6	Entrance Mix		Includes annual rye nurse crop		
2156 m^2	Mix 7	Grassland Mix		Includes annual rye nurse crop		

(s) = Spade Tree
(w) = Whip Tree

LANDSCAPE NOTES:

1. WHIP SIZE BUTTERNUT TREES [INDICATED WITH (w)] TO BE PLANTED ALONG NORTH AND WEST NATURALIZED PROPERTY BUFFERS ONLY.
2. SPADE SIZE TREES [INDICATED WITH (s)] TO BE PLANTED ONLY WHERE NOTED. CONFIRM FINAL LOCATIONS AND QUANTITY BASED ON AVAILABILITY.
3. PLANT SUBSTITUTIONS SHALL NOT BE PERMITTED UNLESS APPROVED BY THE LANDSCAPE ARCHITECT.
4. SEE SPECIFICATIONS FOR SOD AND TOPSOIL SPECIFICATIONS.
5. PITS AND PLANTING BEDS SHOULD BE LOCATED ACCORDING TO THE DRAWINGS AND SHALL BE OF SUFFICIENT SIZE ACCORDING TO THE DETAILS PROVIDED.
6. TREES SHALL BE PLANTED A MINIMUM OF 2.5M FROM HYDRANTS AND 2M FROM WATER STANDPIPES.
7. OBTAIN APPROVAL OF PLANTING LAYOUT PRIOR TO DIGGING.
8. ALL PLANTING BEDS TO BE MULCHED TO A DEPTH OF MINIMUM 75mm AFTER COMPACTION.
9. TOPSOIL DEPTHS: 100mm FOR SODDED AREAS, 150mm FOR SEEDED AREAS, 150mm FOR BERMS, 300mm FOR PLANTING BEDS, AND 300-1000mm FOR BIOSWALES.

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DRAWING TITLE:
PLANTING PLAN
TREES, SHRUBS, SEED MIXES

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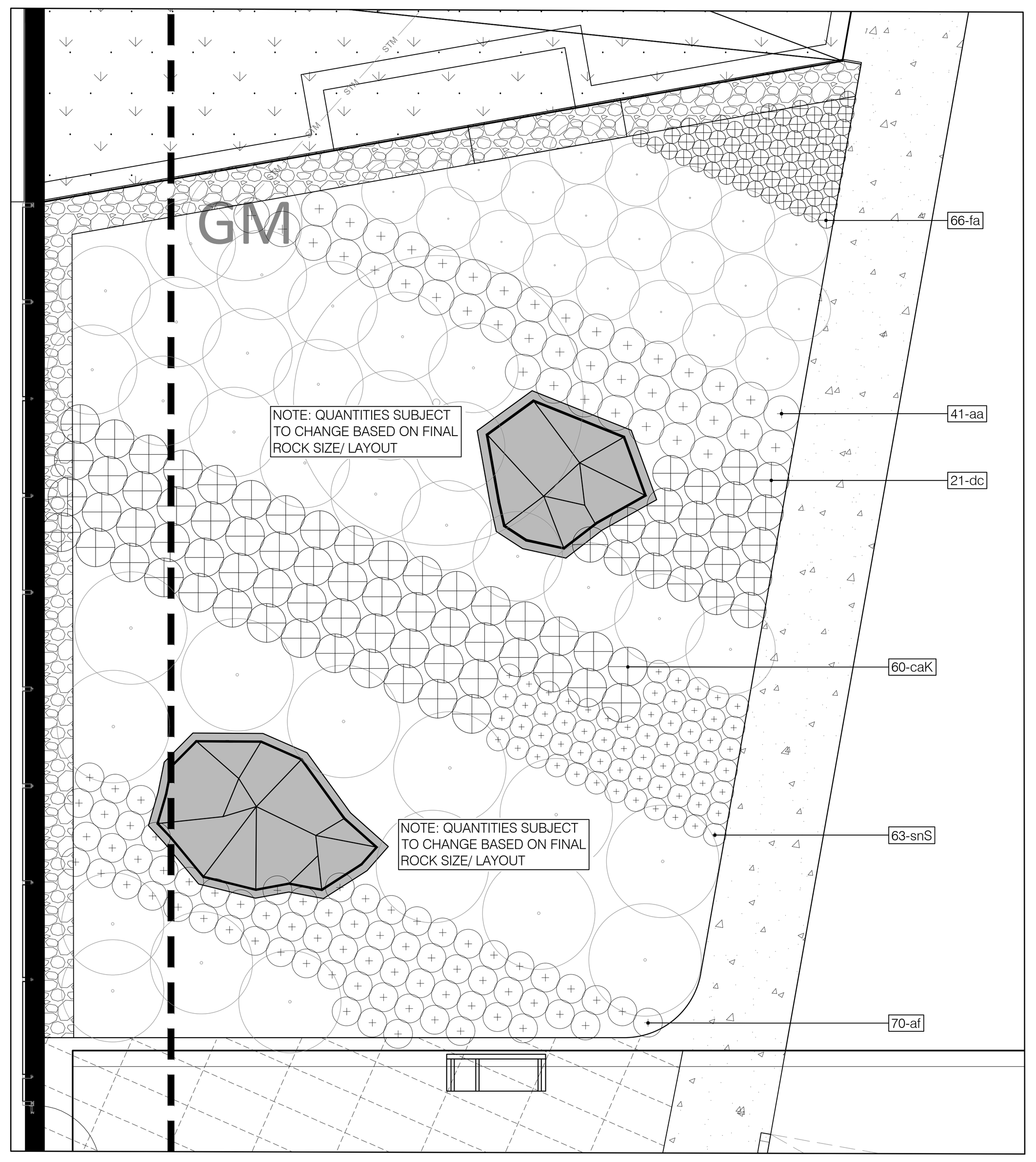
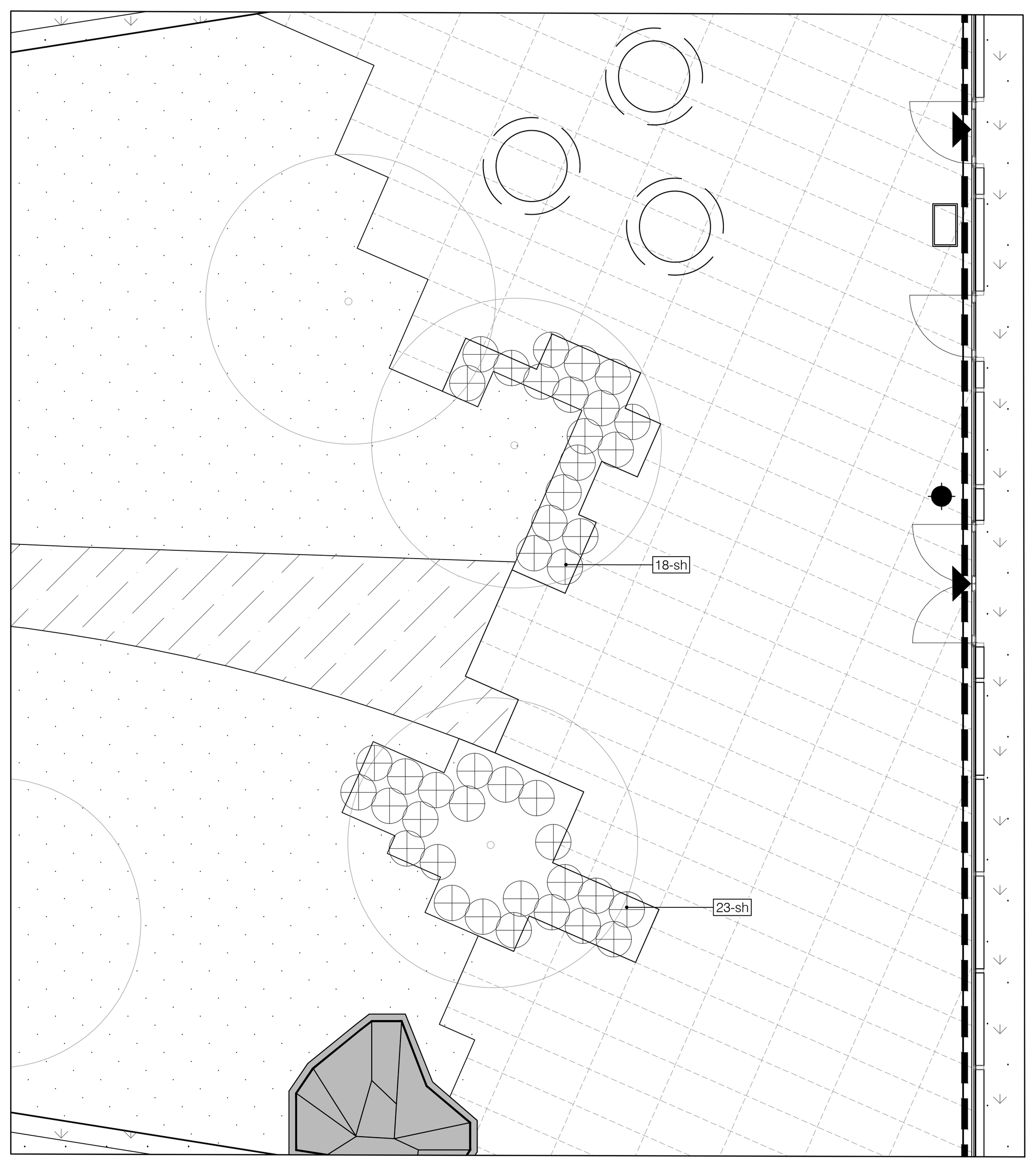
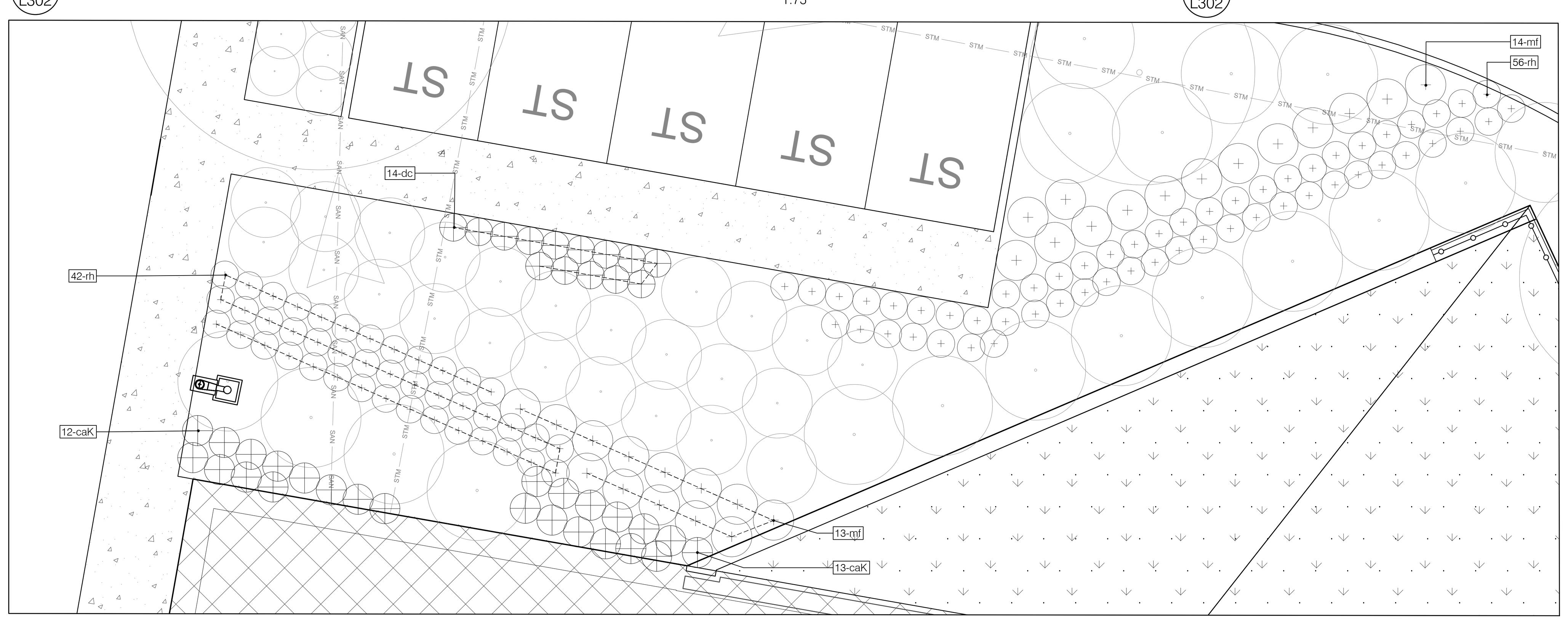
JOB No:	LA 15610-1
DRAWING No:	L301



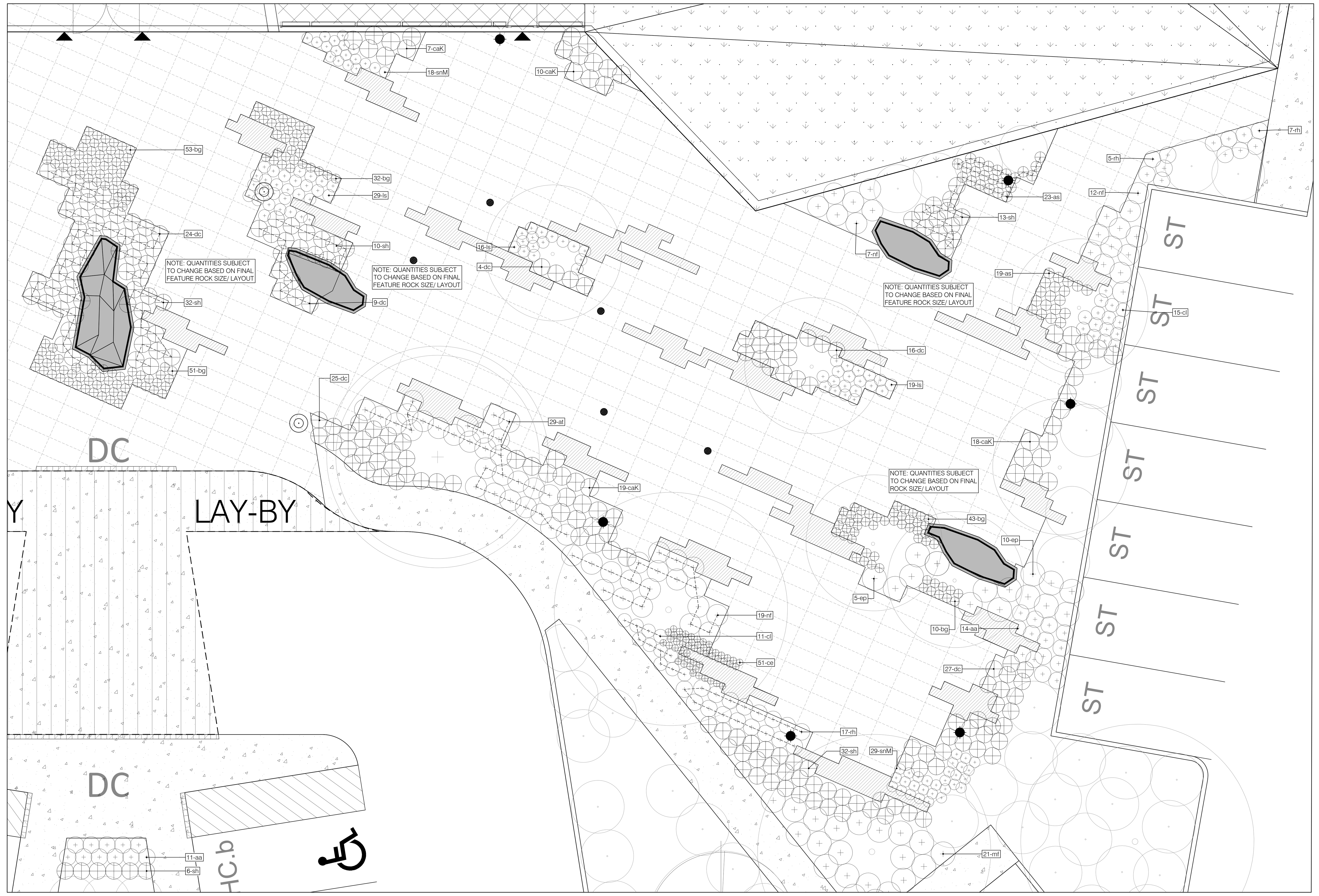
1 L302 SOUTH COURTYARD 1:75



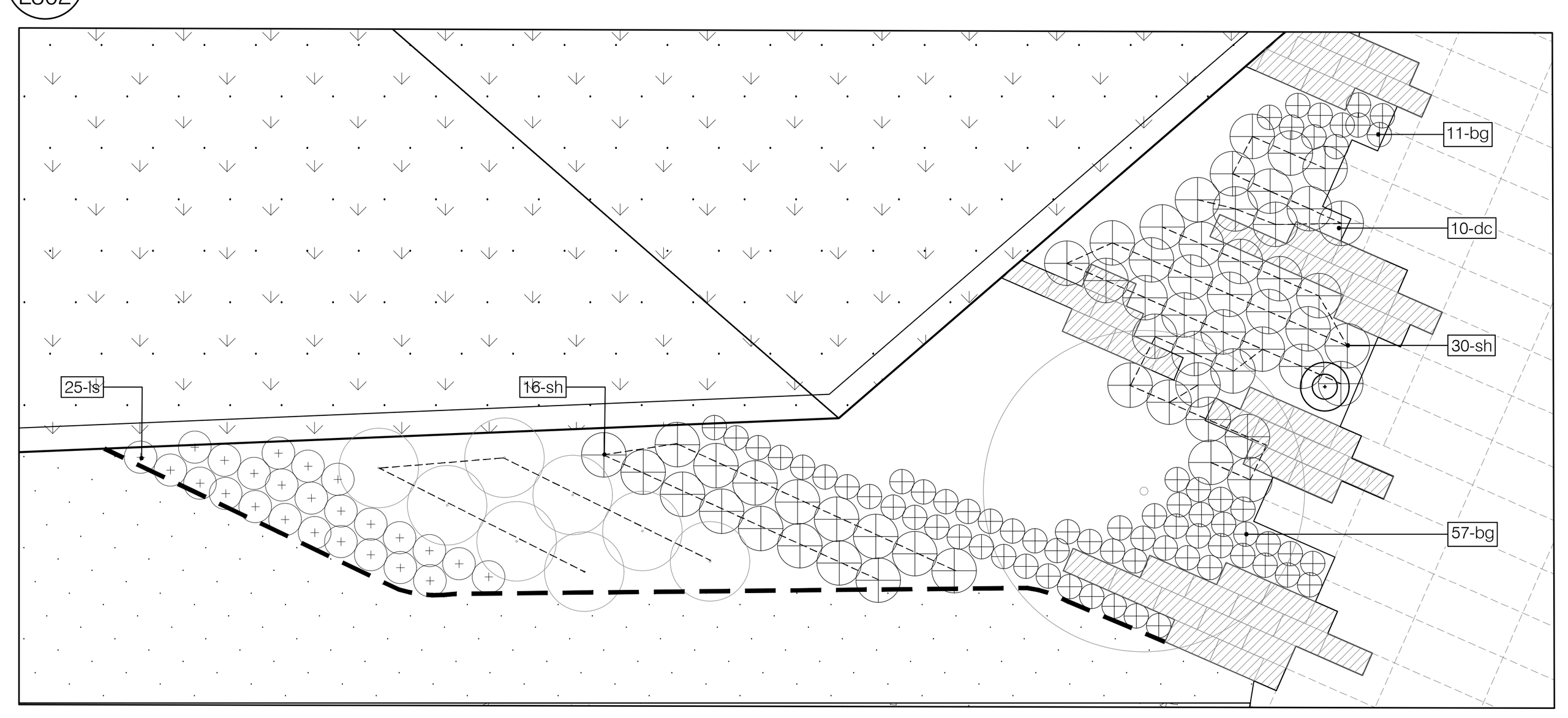
2 L302 NORTH PLAZA 1:75



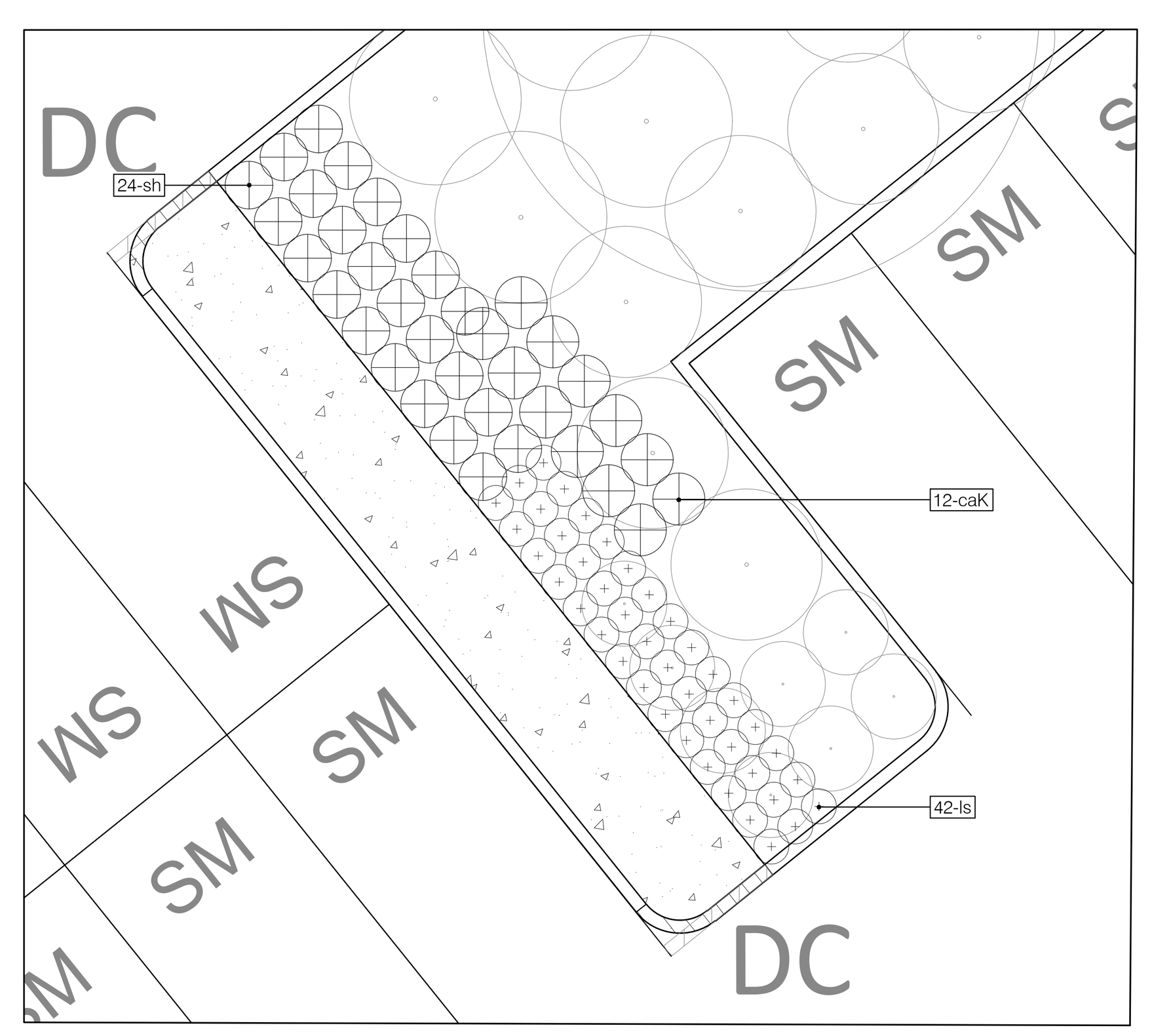
3 L302 TEST FACILITY FRONT 1:75



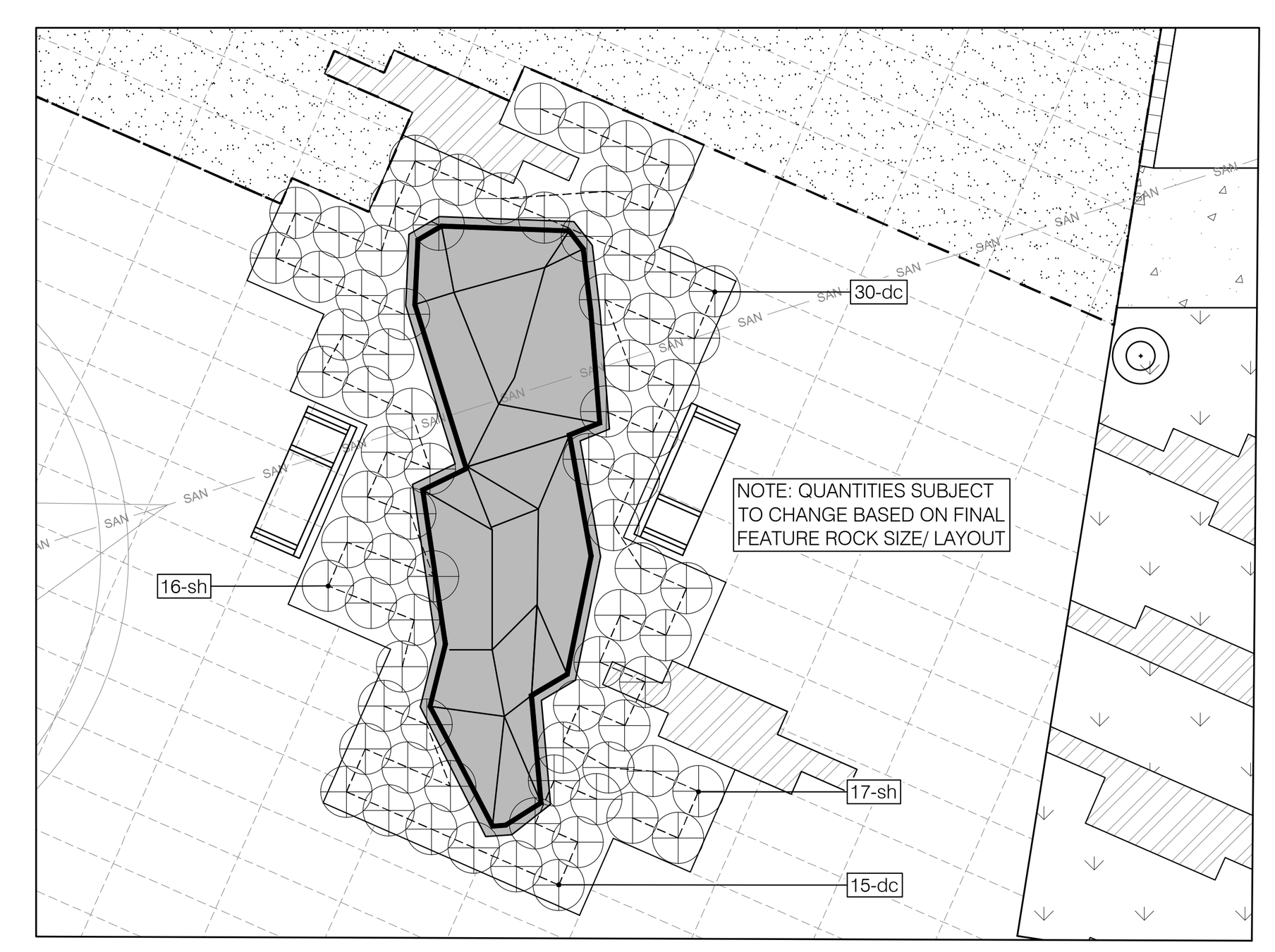
4 L302 CAFETERIA PLAZA 1:75



5 L302 EMPLOYEE ENTRANCE @ BERM WALL 1:75



6 L302 PARKING LOT ISLAND 1:75



7 L302 FRONT ENTRANCE FEATURE ROCK 1:75

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LEGEND:

- PROPERTY LINE
- SETBACK
- LOT LINE
- CONCRETE BARRIER CURB
- DEPRESSED CURB
- STORM SEWER
- SANITARY SEWER
- WATER/SEWER
- BERM FOUNDATION LIMIT
- NEW LANDSCAPE CATCH BASIN
- NEW DITCH INLET CATCHBASIN (DICB)
- NEW CATCHBASIN MANHOLE
- NEW SIAMESE CONNECTION
- EXISTING FIRE HYDRANT
- NEW FIRE HYDRANT
- NEW EXTERIOR LIGHT STANDARDS
- PEDESTRIAN LIGHTING, SEE ELECTRICAL
- BOLLARD LIGHTING, SEE ELECTRICAL
- TYPE 1 CONCRETE SURFACE - LIGHT DUTY
- TYPE 1 CONCRETE SURFACE - HEAVY DUTY
- TYPE 2 CONCRETE SURFACE - LIGHT DUTY - BY TOMLINSON
- TYPE 2 CONCRETE SURFACE - HEAVY DUTY - BY TOMLINSON
- STONEDUST PATH
- RIVERSTONE MAINTENANCE EDGE
- LINE PAINTING - BY TOMLINSON
- WHITE STONE BALLAST
- TYPE 1 NATURAL STONE INLAY
- TYPE 2 NATURAL STONE INLAY
- GUARD FENCE AT BERM WALL
- LANDSCAPE BOULDER
- HORIZONTAL BIKE PARKING (1.8x0.6m)
- BENCH
- WASTE RECEPTACLE
- PROPOSED STREET TREES (BY CITY)
- NEW TREES
- NEW SHRUBS
- PERENNIALS + ORNAMENTAL GRASSES

SEED MIXES + GROUNDCOVERS

- TURF - SOD
- MIX 1: ARCHITECTURAL BERM MIX
- MIX 2: SEASONALLY FLOODED
- MIX 3: BANK MIX
- MIX 4: WILDFLOWER MIX
- MIX 5: WOODLAND EDGE MIX
- MIX 6: ENTRANCE MIX
- MIX 7: GRASSLAND MIX

LANDSCAPE NOTES:

1. PLANT SUBSTITUTIONS SHALL NOT BE PERMITTED UNLESS APPROVED BY THE LANDSCAPE ARCHITECT.
2. SEE SPECIFICATIONS FOR SOD AND TOPSOIL SPECIFICATIONS.
3. PITS AND PLANTING BEDS SHOULD BE LOCATED ACCORDING TO THE DRAWINGS AND SHALL BE OF SUFFICIENT SIZE ACCORDING TO THE DETAILS PROVIDED.
4. TREES SHALL BE PLANTED A MINIMUM OF 2.5M FROM HYDRANTS AND 2M FROM WATER STANDPIPES.
5. OBTAIN APPROVAL OF PLANTING LAYOUT PRIOR TO DIGGING.
6. ALL PERENNIAL AND SHRUB PLANTING BEDS TO BE MULCHED TO A DEPTH OF MINIMUM 75mm AFTER COMPACTION.
7. TOPSOIL DEPTHS: 100mm FOR SODDED AREAS, 150mm FOR SEEDED AREAS, 150mm FOR BERMS, 300mm FOR PLANTING BEDS, AND 300-1000mm FOR BIOSWALES.

TOMLINSON NEW OFFICE PLANT LIST: L202

QTY	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	COMMENT	SPACING
PERENNIALS						
61	aa	Fanal Feather Flower	*Astilbe ardnessi 'Fanal'*	1 Gallon	Potted	550
29	at	Butterfly Weed	*Asclepias tuberosa*	1 Gallon	Potted	450
70	af	Lady Fern	*Athyrium filix-femina*	1 Gallon	Potted	700
27	cl	Lance-leaved Tickseed	*Coreopsis lanceolata*	1 Gallon	Potted	450
15	ep	Magnus Purple Coneflower	*Echinacea purpurea 'Magnus'*	1 Gallon	Potted	800
134	ls	Floristan Purple Blazing Star	*Liatris spicata 'Floristan Purple'*	1 Gallon	Potted	400
50	mf	Wild Bergamot	*Monarda fistulosa*	1 Gallon	Potted	800
50	nf	Walker's Low Catmint	*Nepeta x faassenii 'Walker's Low'*	1 Gallon	Potted	800
115	rh	Black Eyed Susan	*Rudbeckia hirta*	1 Gallon	Potted	550
46	snM	Marcus Salvia	*Salvia nemorosa 'Marcus'*	1 Gallon	Potted	350
64	snS	Snow Hill Salvia	*Salvia nemorosa 'Snow Hill'*	1 Gallon	Potted	550
ORNAMENTAL GRASSES						
42	as	Prairie Blues Little Bluestem	*Andropogan scoparius 'Prairie Blues'*	1 Gallon	Potted	350
290	bg	Blue Grama Grass	*Bouteloua gracilis*	1 Gallon	Potted	250
152	caK	Foerster's Feather Reed Grass	*Calamagrostis acutiflora 'Karl Foerster'*	1 Gallon	Potted	600
51	ce	Bristle-Leaf Sedge	*Carex eburnea*	1 Gallon	Potted	200
195	dc	Gold Veil Tufted Hair Grass	*Deschampsia cespitosa 'Gold Veil'*	1 Gallon	Potted	550
66	fa	Tufted Fescue	*Festuca amethystina*	1 Gallon	Potted	250
233	sh	Prairie Dropseed	*Sporobolus heterolepsis*	1 Gallon	Potted	550

No.	DATE	DESCRIPTION
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02	13.04.2016	REVISED SITE PLAN APPLICATION
01	18.12.2015	ISSUED FOR SITE PLAN APPLICATION

SEAL: ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS – MARINA SIGNER – OALA – MEMBER

PROJECT NORTH: N

TOMLINSON tomlinsongroup.com
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PROJECT:
TOMLINSON
NEW BUILDING
4501 STRANDHERD DRIVE

DRAWING TITLE:
PLANTING PLAN
PERENNIALS AND GRASSES

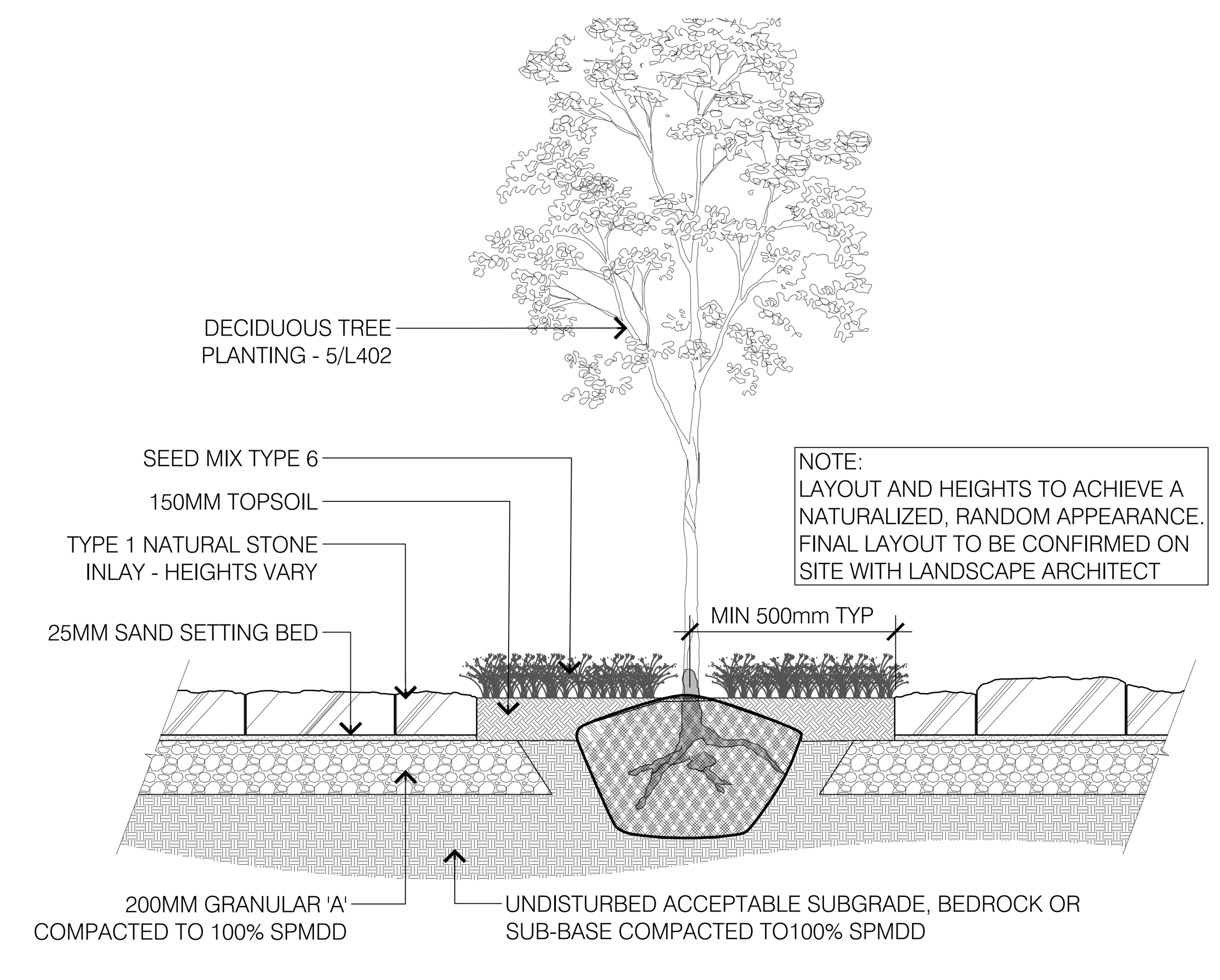
DATE:	10/8/2015
SCALE:	AS INDICATED
DRAWN BY:	MS
JOB No:	LA 15610-1

DRAWING No: L302

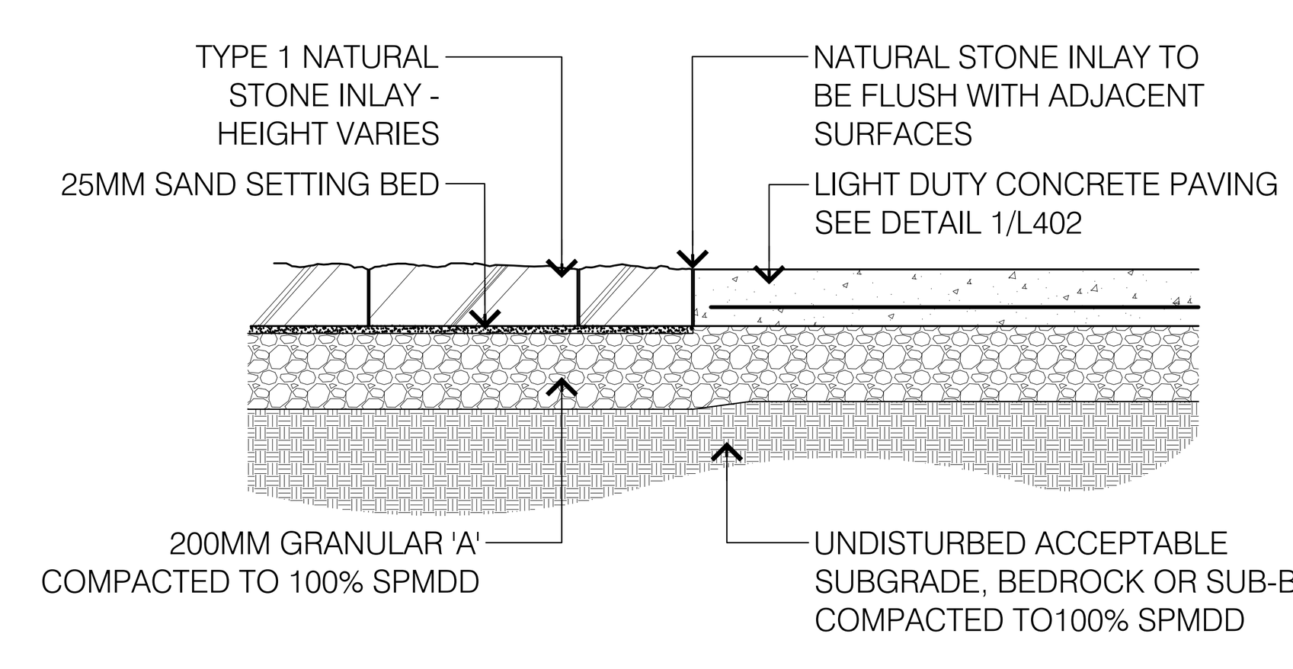
LAYOUT: L401 – LANDSCAPE DETAILS

PLOT DATE 8/25/2017

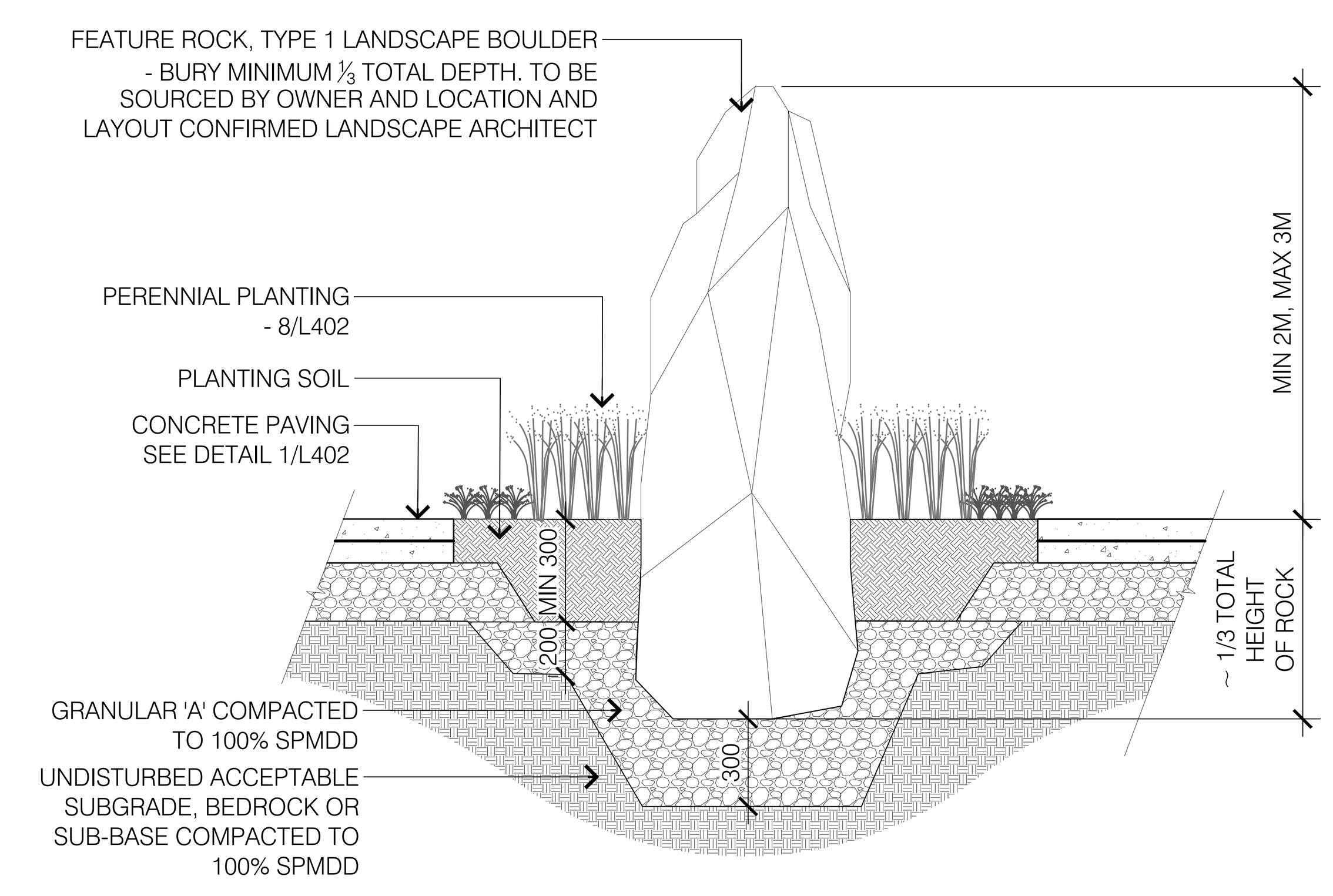
\\Mac\Projects\2000 +\2010 +\15610-1 Tomlinson Headquarters\5.0 WORKING DRAWINGS\100% IFC\15610-1 Tomlinson90% – Standard\15610-1_Tomlinson_Landscape_IFC_25-08-17.dwg



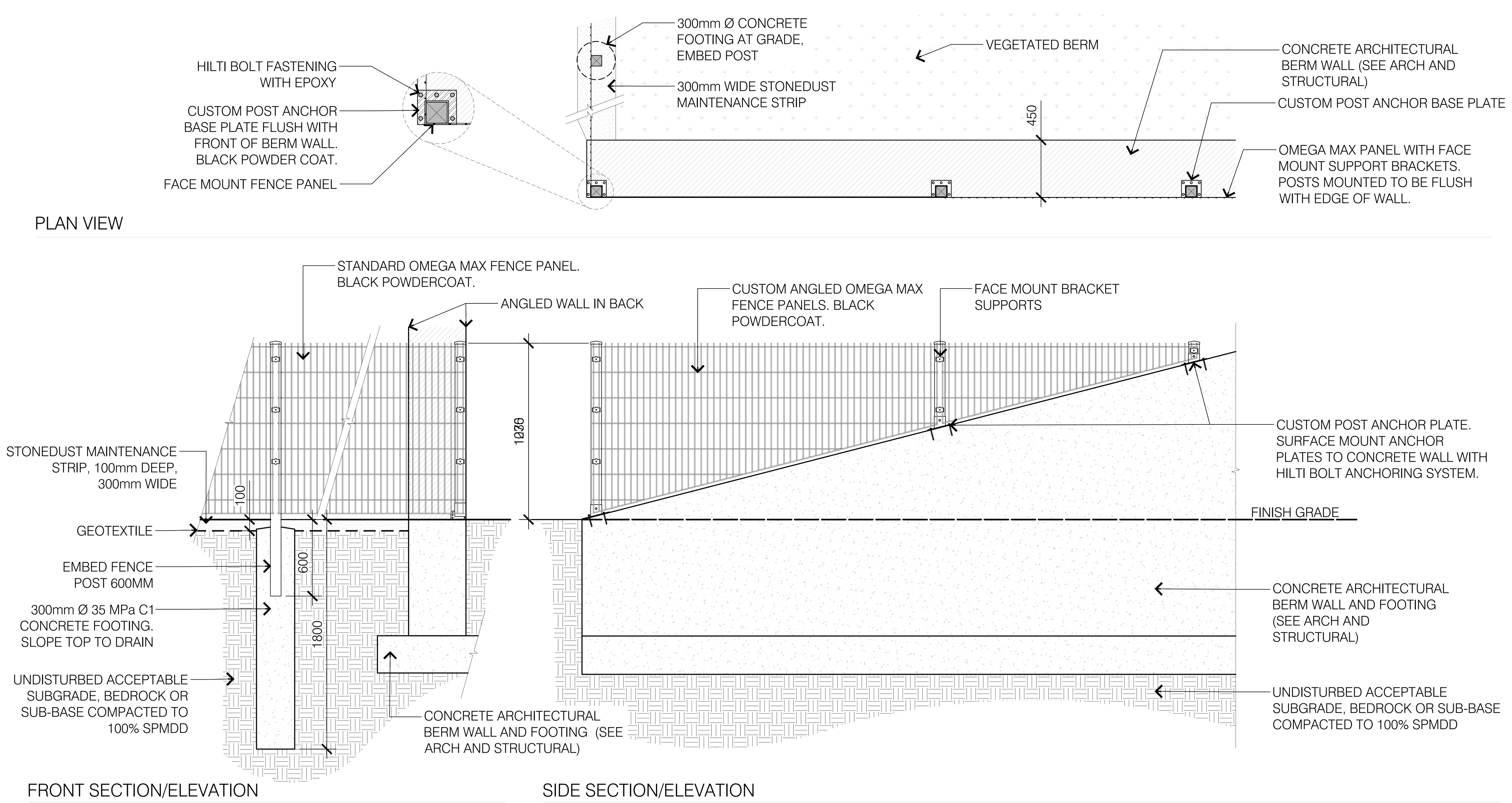
1 L401 TYPE 1 NATURAL STONE INLAY @ TREE GROVE 1:20



2 L401 TYPE 1 NATURAL STONE INLAY @ ENTRANCE PLAZA 1:20

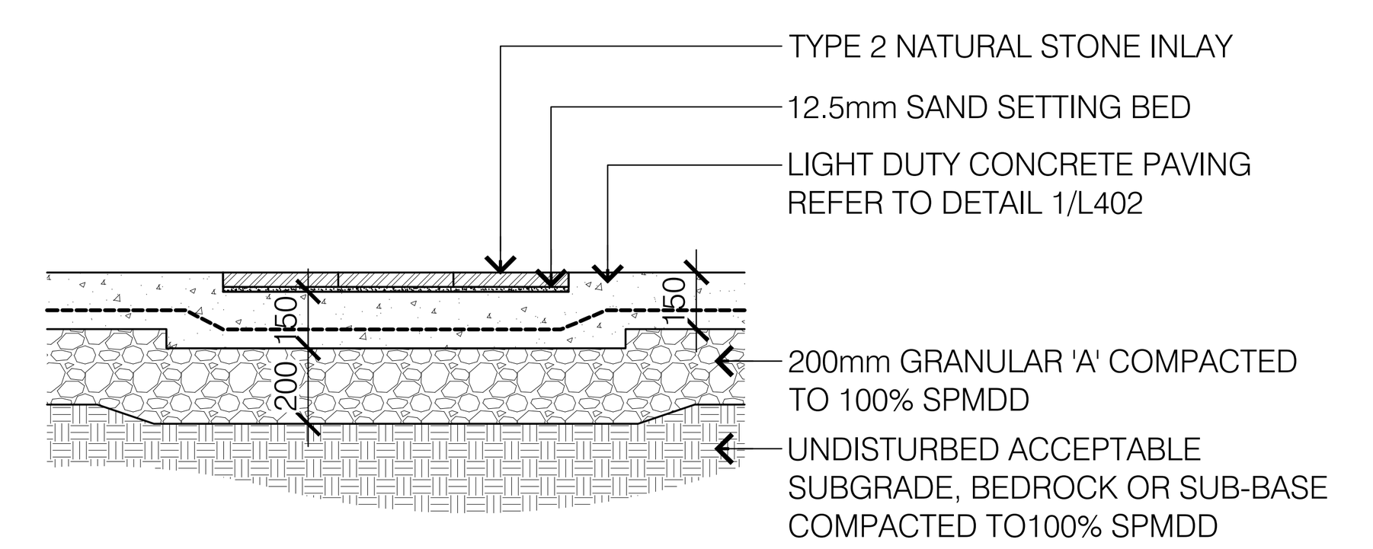


3 L401 LANDSCAPE BOULDER @ ENTRANCE - SECTION 1:20



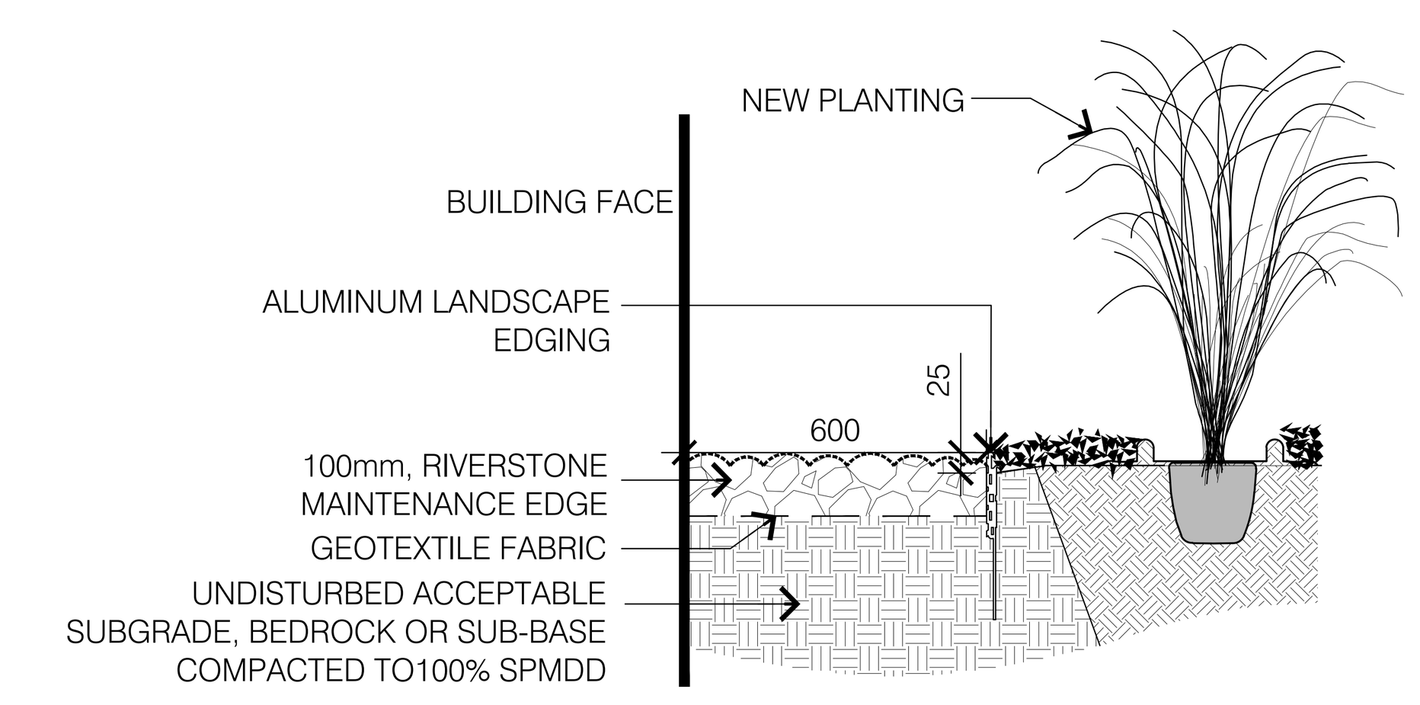
NOTE:
CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR FENCE PANELS AND CUSTOM BASE PLATES.
CONTRACTOR TO CONFIRM ALL WALL ANGLES ON SITE.

4 L401 FENCING @ BERM WALL 1:25

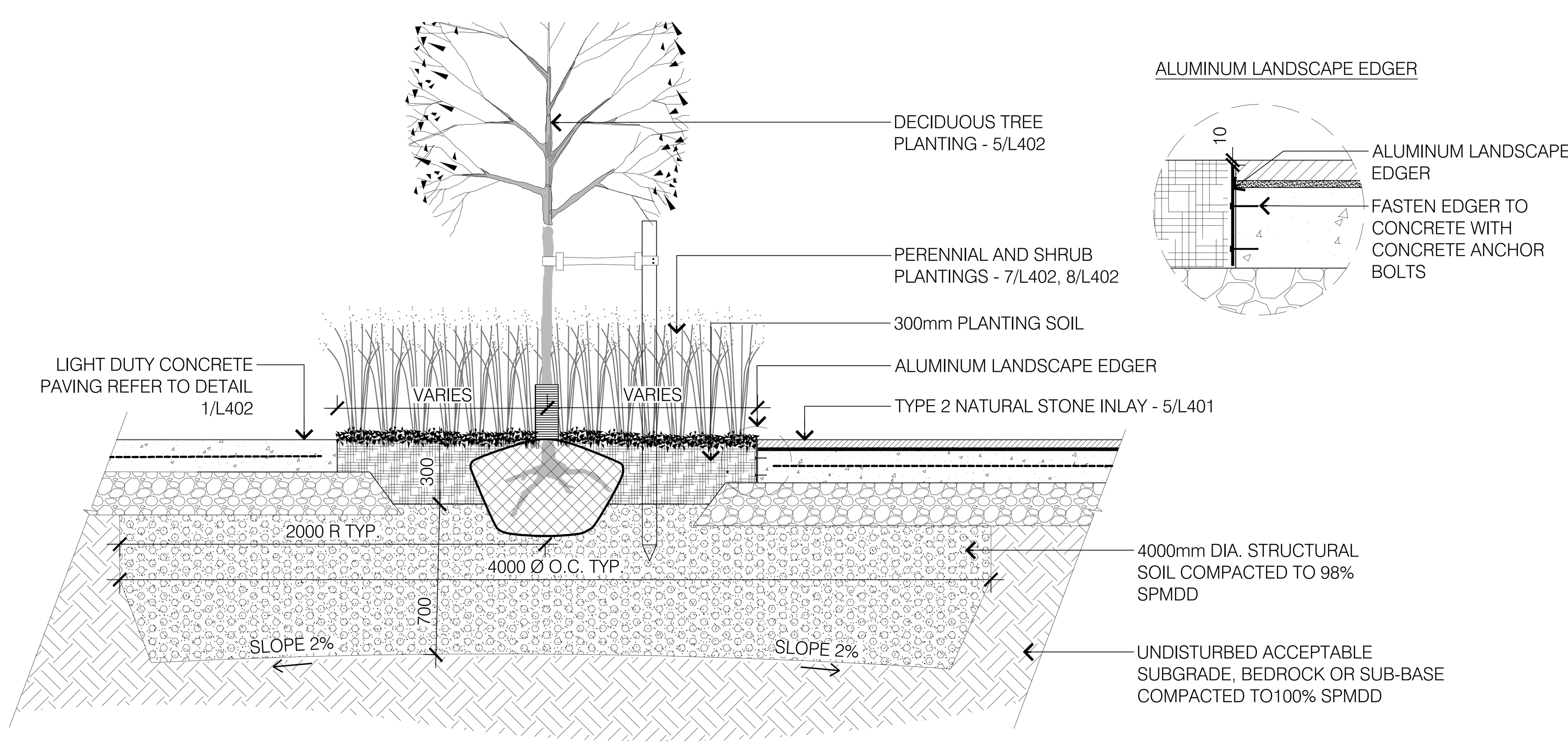


NOTES:
JOINTS TO BE SWEPT WITH JOINT SAND OR FINES TO ENSURE TIGHT BONDING.
ALL SURFACES TO BE THOROUGHLY BROOM CLEANED

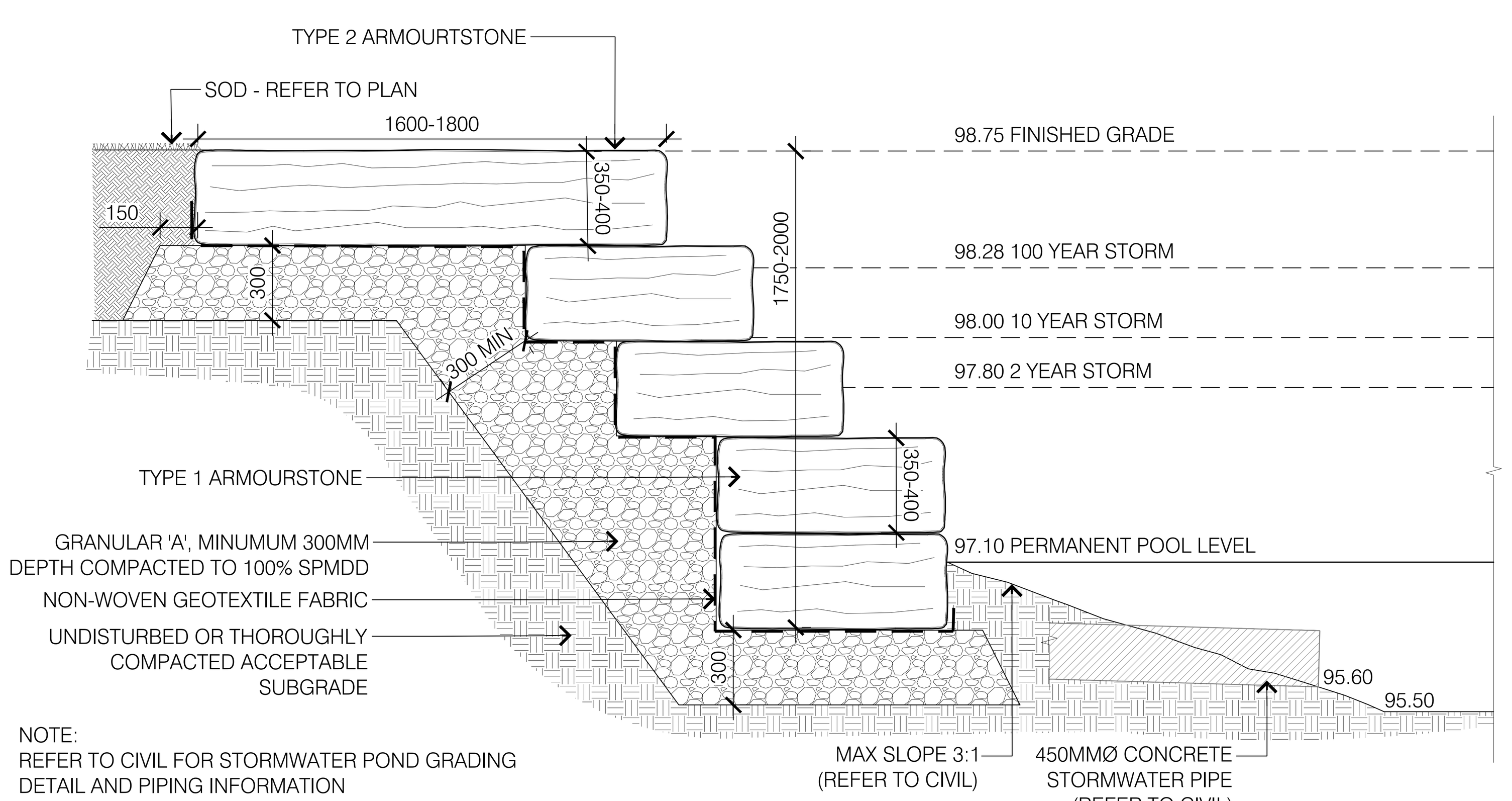
5 L401 TYPE 2 NATURAL STONE INLAY @ CONCRETE PAVING 1:20



6 L401 RIVERSTONE MAINTENANCE EDGE NTS

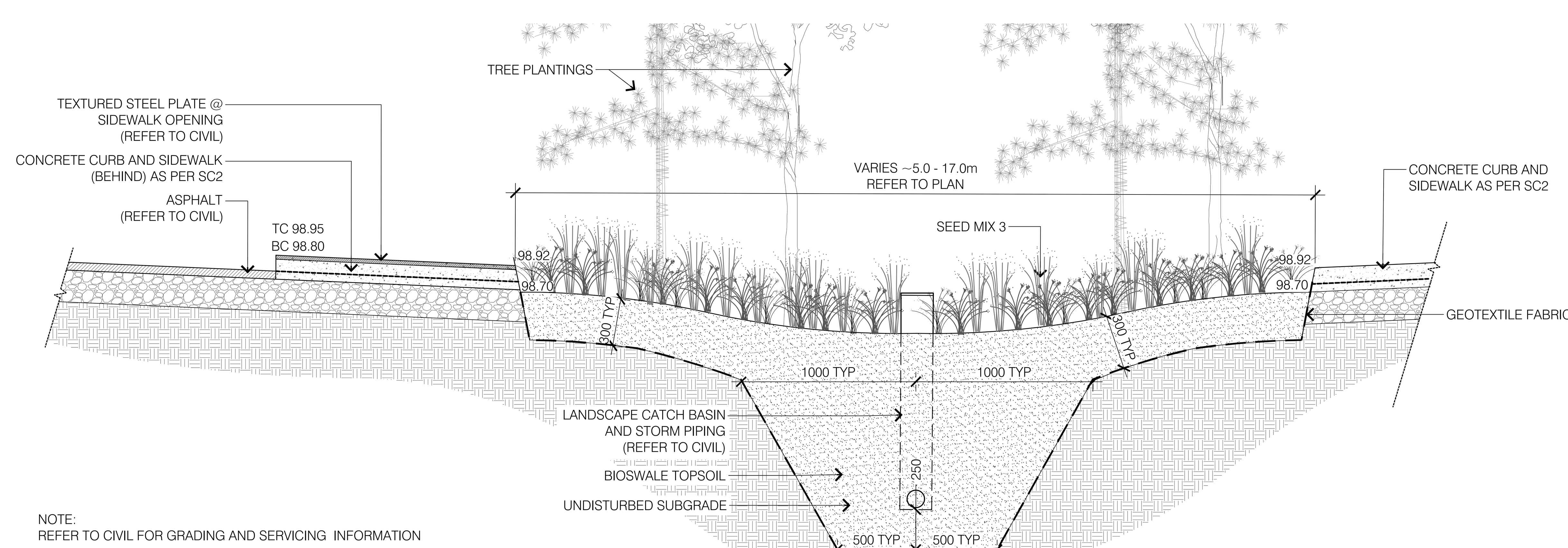


7 L401 STRUCTURAL SOIL PLANTING ISLAND 1:20



NOTE:
REFER TO CIVIL FOR STORMWATER POND GRADING DETAIL AND PIPING INFORMATION

8 L401 STORMWATER POND ARMOURSTONE WALL 1:20



NOTE:
REFER TO CIVIL FOR GRADING AND SERVICING INFORMATION

9 L401 BIOSWALE CROSS SECTION 1:20

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03	31.05.2016	ISSUED FOR FOUNDATION PERMIT
02	13.04.2016	REVISED SITE PLAN APPLICATION
01	18.12.2015	ISSUED FOR SITE PLAN APPLICATION

SEAL:

PROJECT NORTH:

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FOUNDED ON STRENGTH GUIDED BY VISION

LASHLEY + ASSOCIATES
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PROJECT:

TOMLINSON
NEW BUILDING
4501 STRANDHERD DRIVE

DRAWING TITLE:

LANDSCAPE DETAILS

DATE:	10/8/2015
SCALE:	AS INDICATED
DRAWN BY:	MS
JOB No:	LA 15610-1

DRAWING No:

L401

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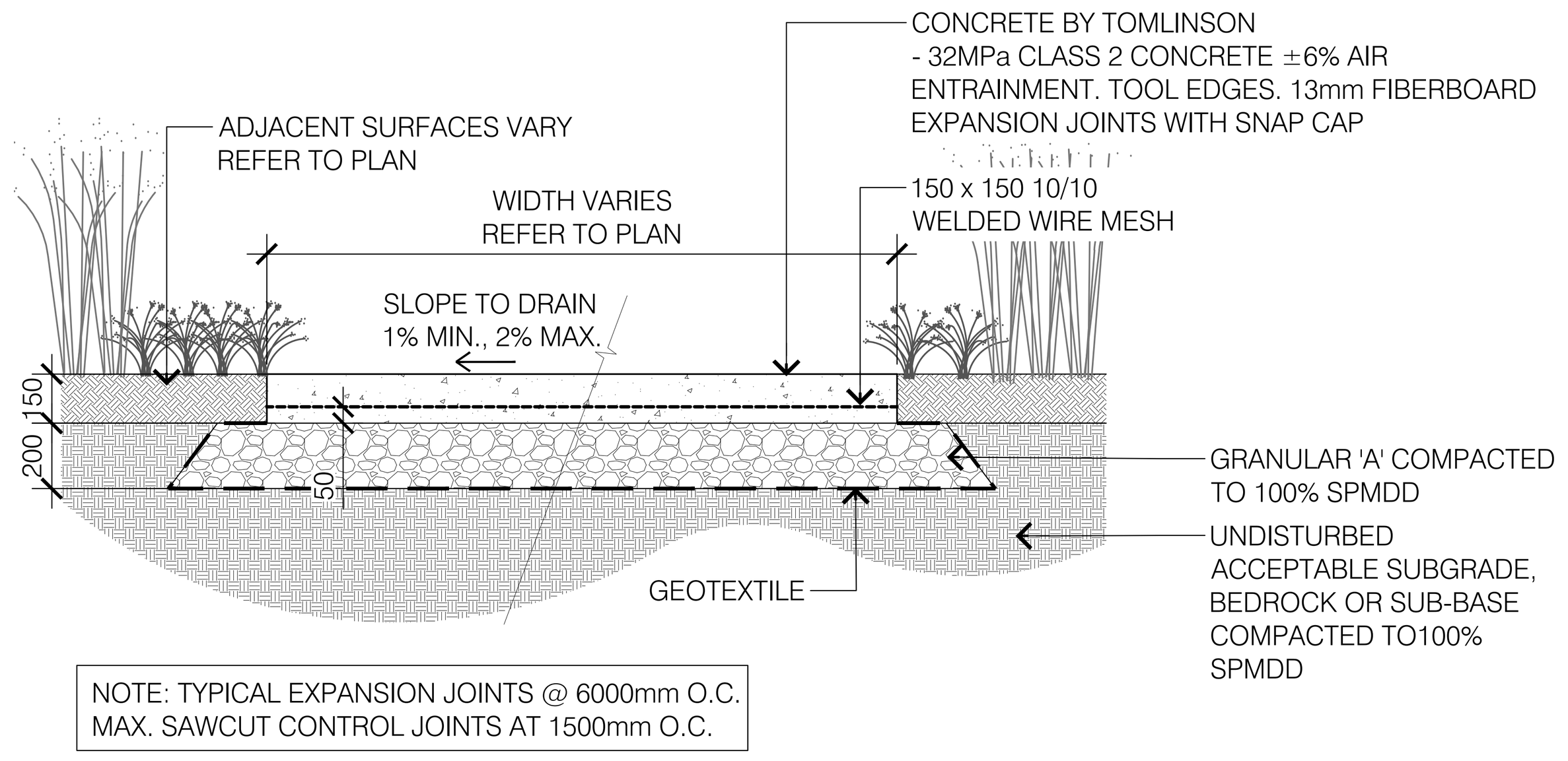
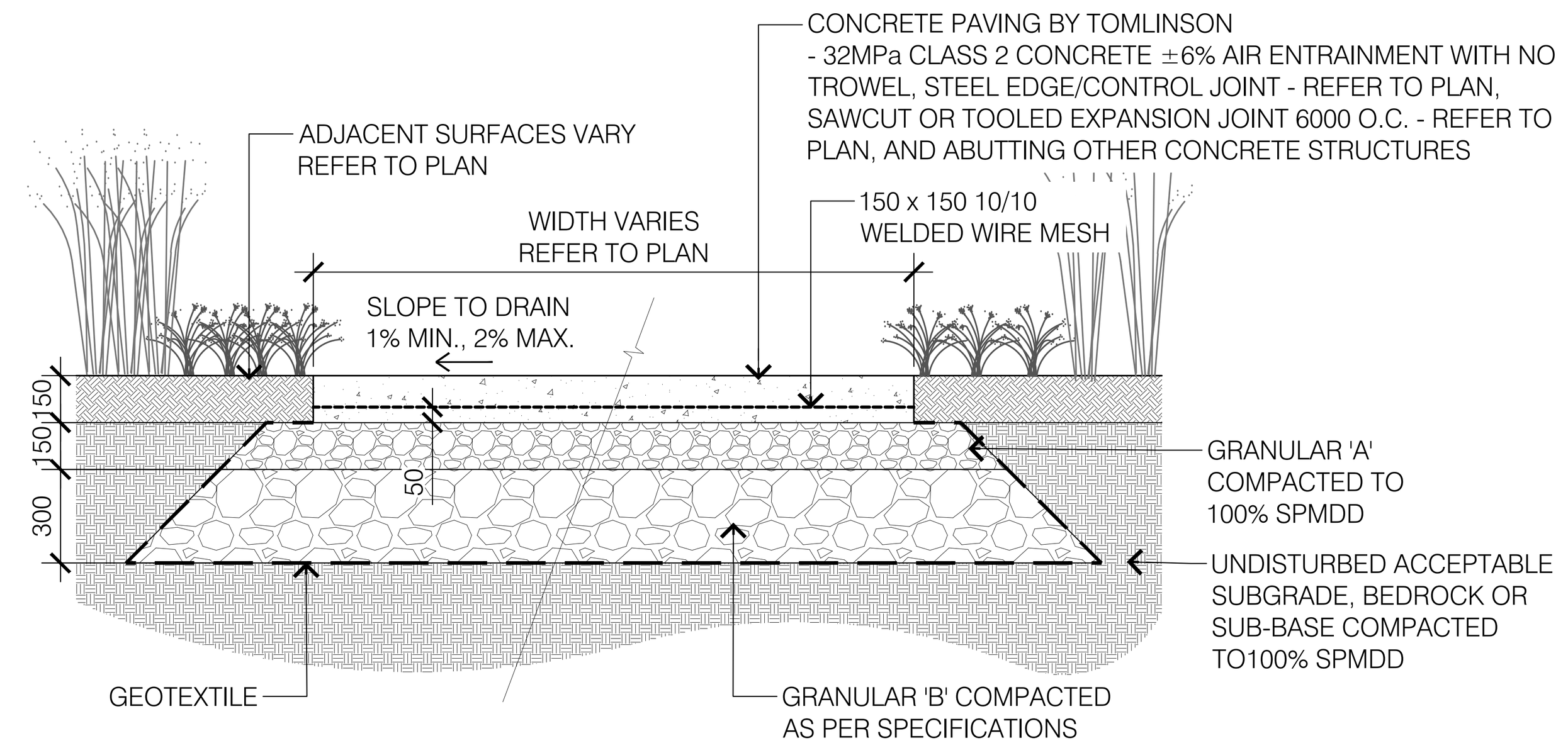
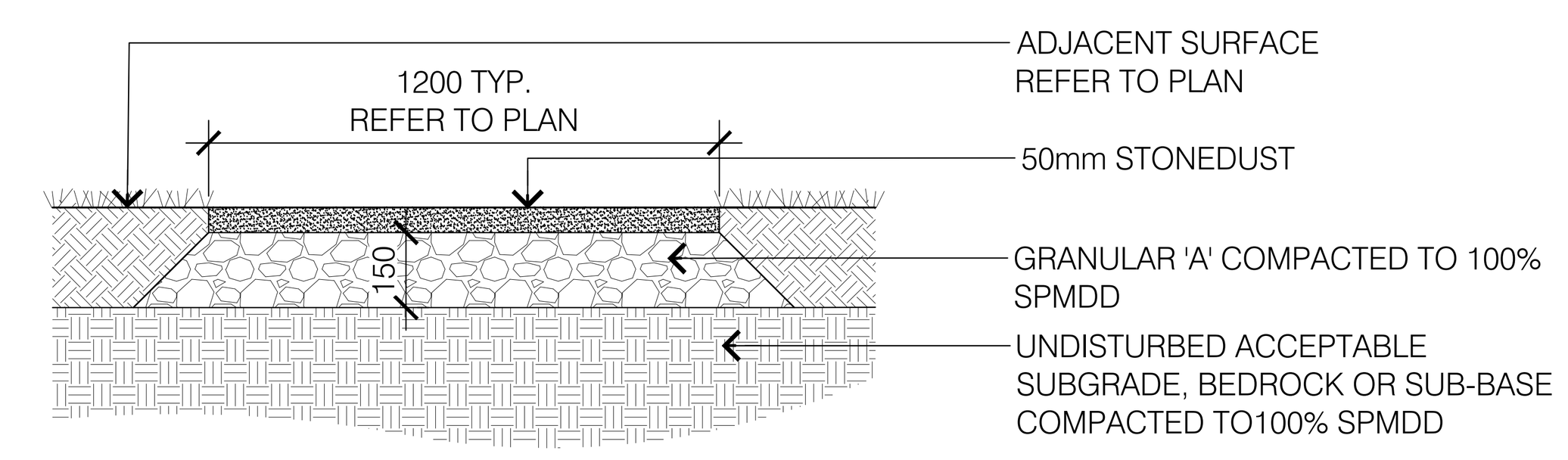
PLOT DATE 8/25/2017
LAYOUT: L402 – LANDSCAPE DETAILS 2



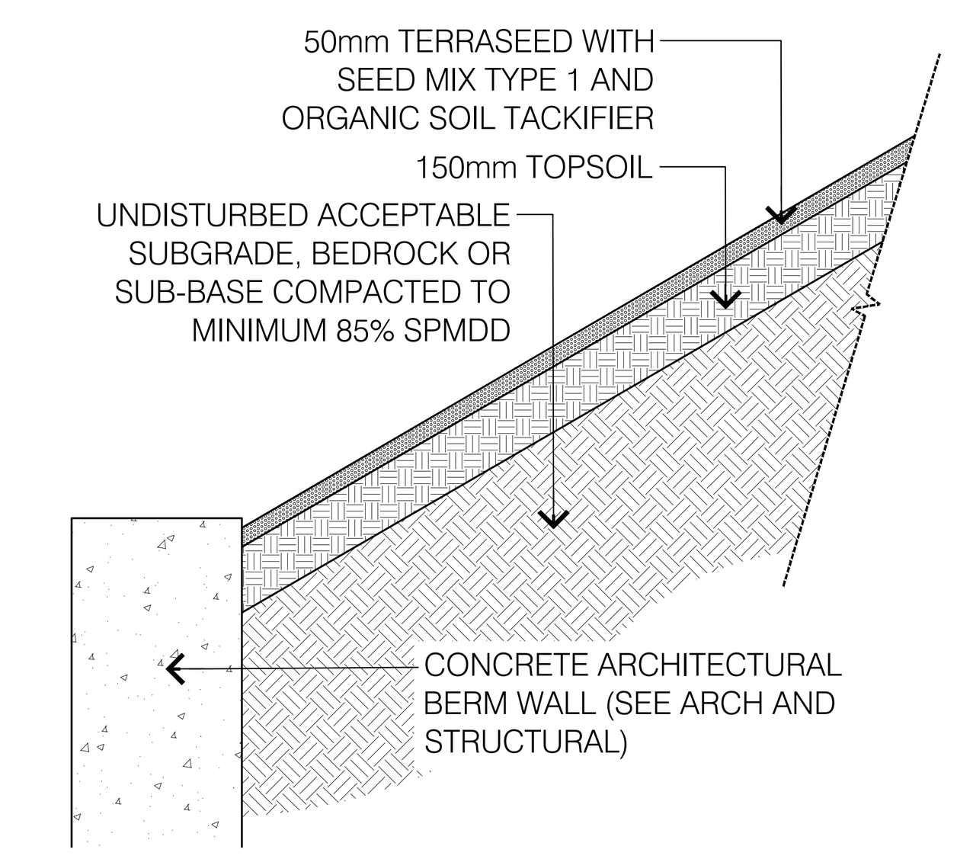
1 L402 LIGHT DUTY CONCRETE PAVING 1:20



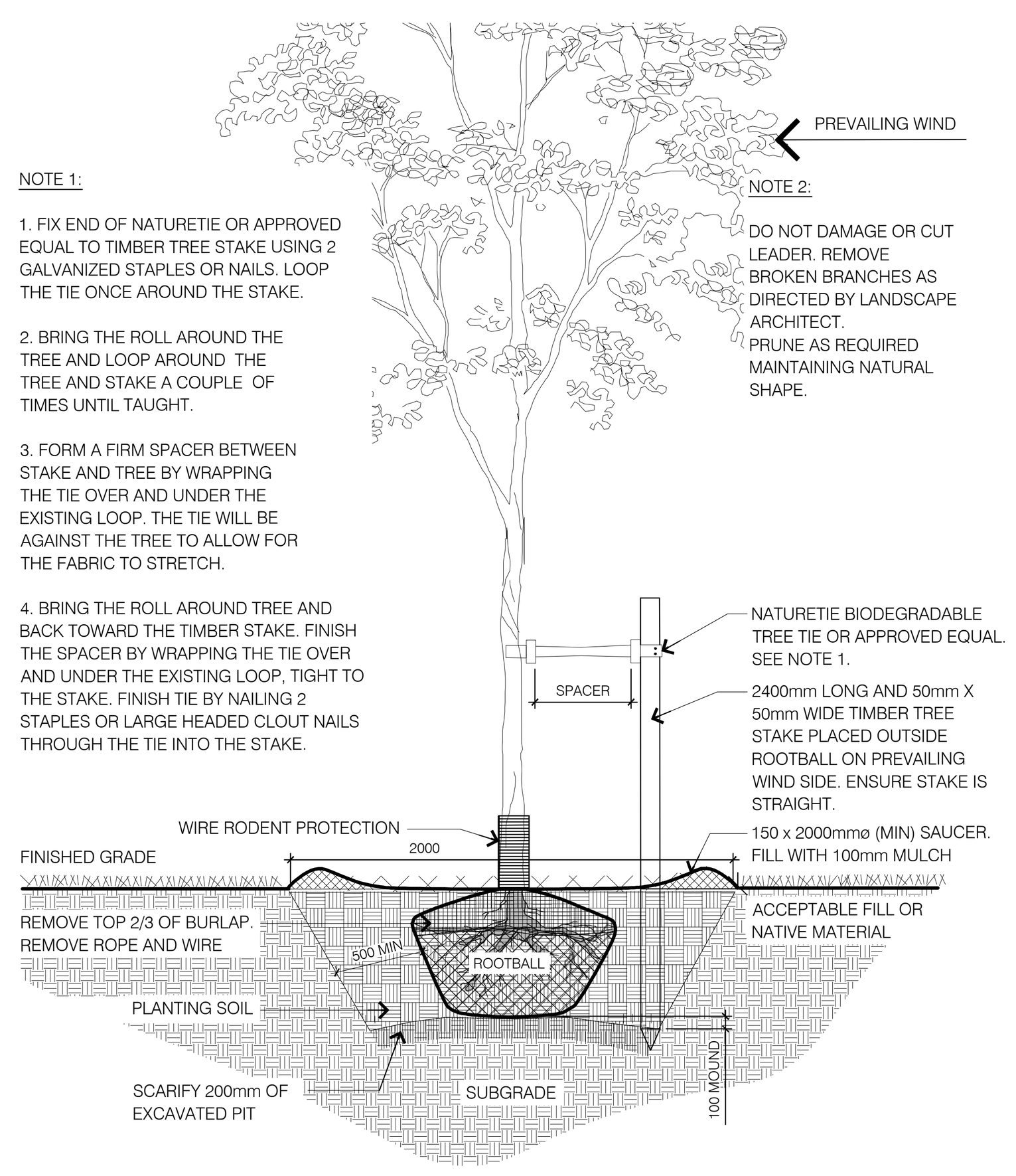
2 L402 HEAVY DUTY CONCRETE PAVING 1:20



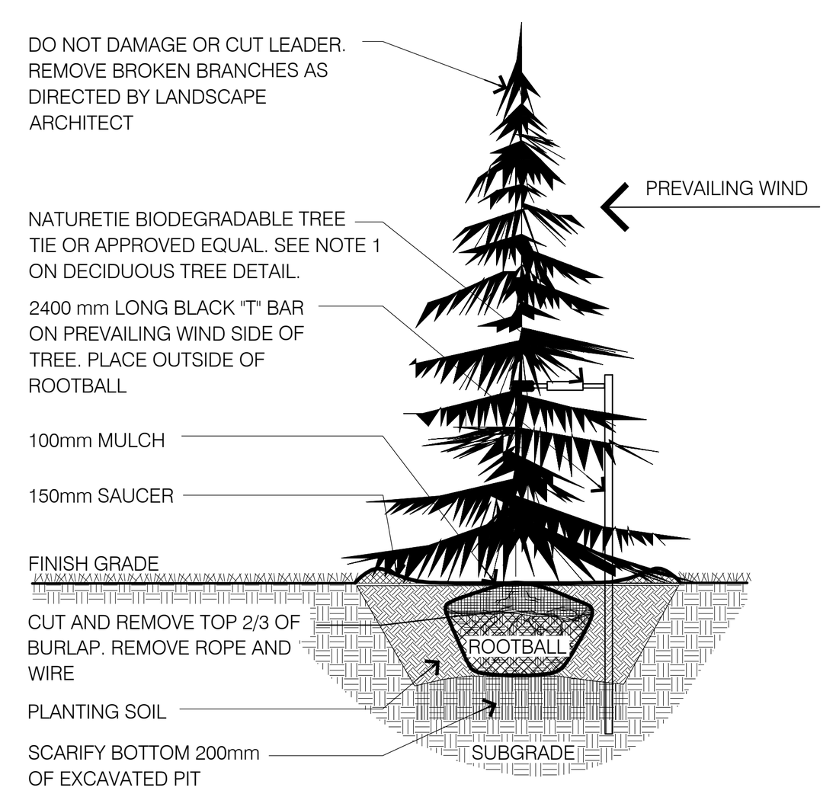
3 L402 STONEDUST SURFACE 1:15



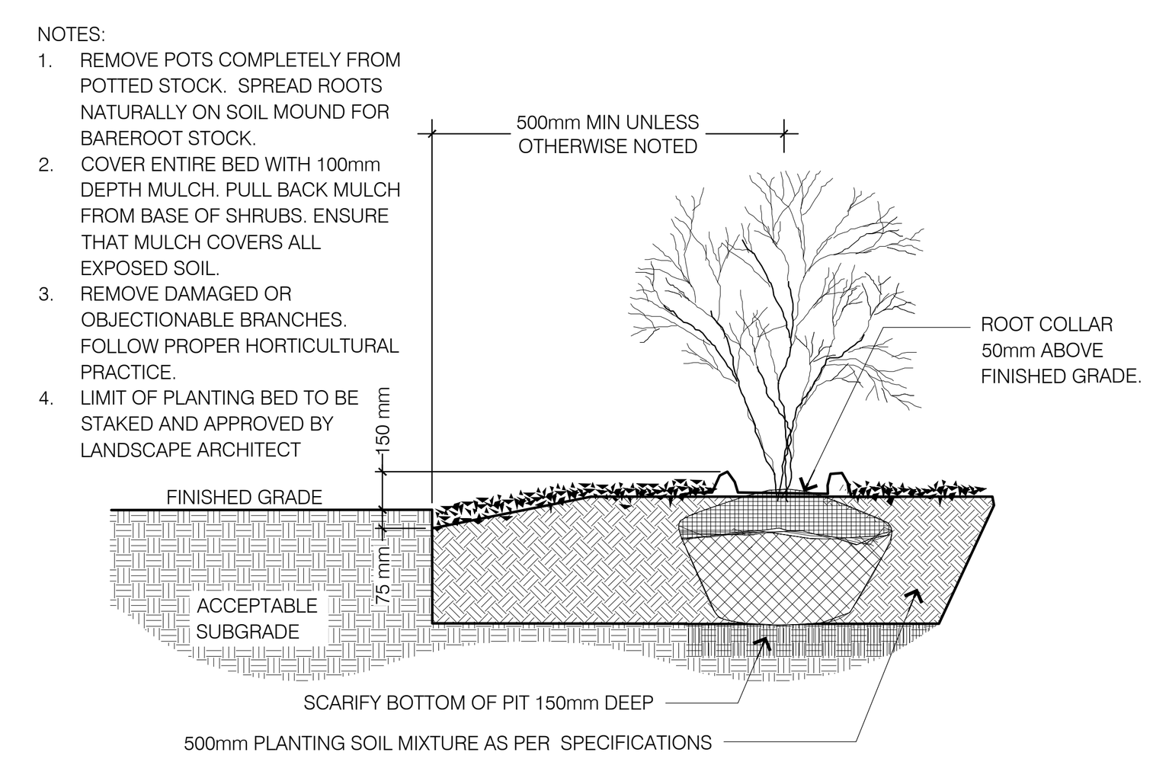
4 L402 TERRASEED NTS



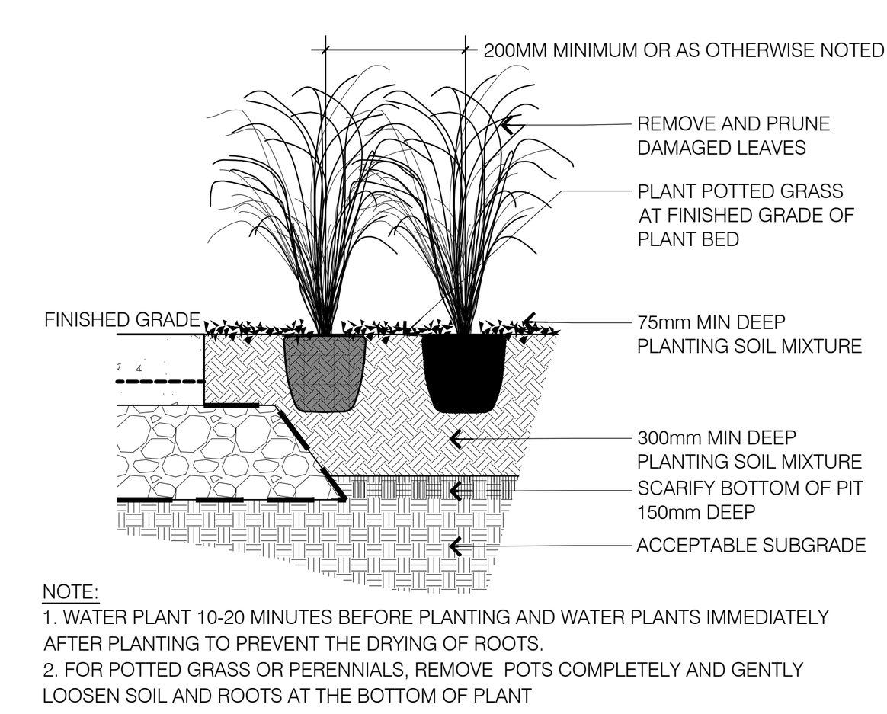
5 L402 DECIDUOUS TREE PLANTING NTS



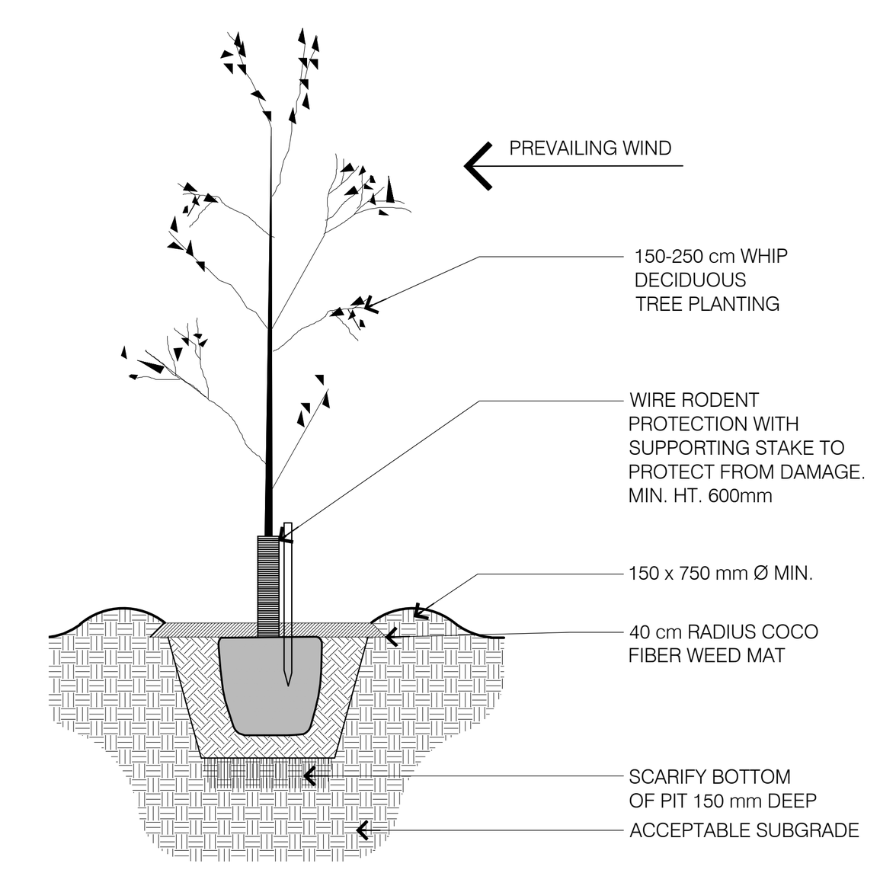
6 L402 CONIFEROUS TREE PLANTING NTS



7 L402 SHRUB PLANTING NTS



8 L402 PERENNIAL PLANTING NTS



9 L402 WHIP TREE PLANTING NTS

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PROJECT NORTH:

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E Mail@LashleyLA.com

PROJECT:
TOMLINSON
NEW BUILDING
4501 STRANDHERD DRIVE

DRAWING TITLE:
LANDSCAPE DETAILS 2

DATE:	10/8/2015
SCALE:	AS INDICATED
DRAWN BY:	MS
JOB No:	LA 15610-1

DRAWING No:
L402