

**Urban Forest Appendix**  
**Details For Section M – Development Manual**  
**Tree Planting & Establishment**  
**Best Management Practices**

| <b>Inspection Certificate</b>            |                                                                                            |
|------------------------------------------|--------------------------------------------------------------------------------------------|
| UF.1.1                                   | Initial Acceptance Certificate – Tree Planting and Soil Habitat Zone                       |
| <b>Soils</b>                             |                                                                                            |
| UF.3.1                                   | Soil Habitat Zone & Volume Requirements For Trees In Boulevards                            |
| UF.3.2                                   | Soil Habitat Zone & Root Pathways - Type 1 (Big O Pipe)                                    |
| UF.3.3                                   | Soil Habitat Zone & Root Pathways - Type 2 (Silva Cells)                                   |
| UF.3.4                                   | Soil Habitat Zone Installation & Specifications                                            |
| UF.3.5                                   | Soil Habitat Zone & Silva Cells                                                            |
| UF.3.6                                   | Soil Volume Calculator (available from City of Kitchener Operations Division upon request) |
| <b>Tree Planting &amp; Establishment</b> |                                                                                            |
| UF.4.1                                   | Standard Deciduous Tree Planting Detail                                                    |

**Initial Acceptance Certificate – Tree Planting and Soil Habitat**



**Date of Inspection:** \_\_\_\_\_ **Subdivision #:** 30T- \_\_\_\_\_

**Subdivision Name:** \_\_\_\_\_ **Stage #:** \_\_\_\_\_

**Subdivider :** \_\_\_\_\_ **Registered Plan #:** 58M- \_\_\_\_\_

**Inspection Area (street, lot number etc.):** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Verification of Site Conditions as per Development Manual and Approved Street Tree Planting Plan**

- ☐ Root pathways constructed
- ☐ Boulevard soil habitat constructed to 450mm depth
- ☐ Front yard soil habitat topsoil depth ☐ 900mm; or  
☐ other (specify depth of topsoil) \_\_\_\_\_ mm (min 450mm)
- ☐ Front yard soil habitat scarified to 900mm depth
- ☐ Street tree installation

**Comments:** \_\_\_\_\_

\_\_\_\_\_

**Affirmation**

- ☐ I have inspected the site in accordance with the approved subdivision agreement, and hereby recommend that the elements inspected are constructed in accordance with the City of Kitchener Subdivision Manual and Approved Street Tree Planting Plan and meet all the requirements for Initial Acceptance.

\_\_\_\_\_  
Consultant (Name)

\_\_\_\_\_  
Consulting Firm

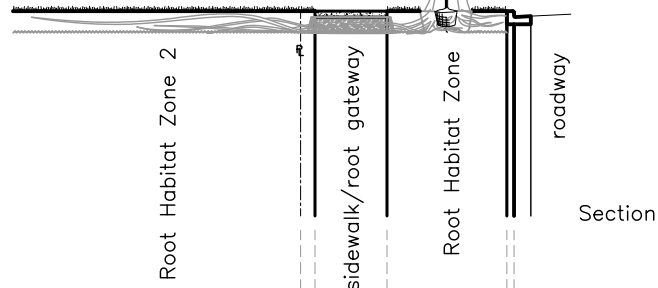
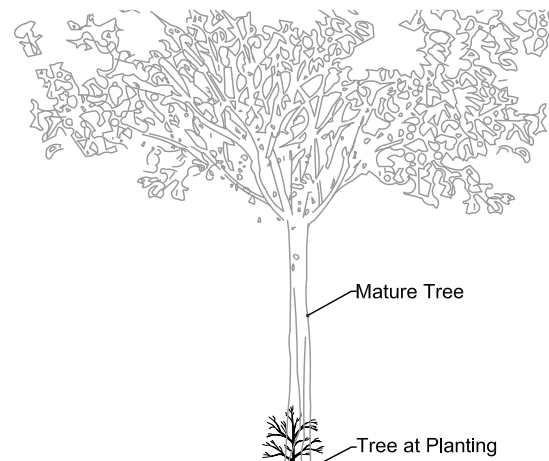
\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

cc: City of Kitchener, Engineering  
City of Kitchener, Operations

| Minimum Soil Volume (SV) Requirements by Tree Size |                                   |                                    |                                   |
|----------------------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|
|                                                    | Large Stature Tree (LST)<br>≥60cm | Medium Stature Tree (MST)<br>≥40cm | Small Stature Tree (SST)<br>20 cm |
| Minimum SV for one tree                            | 45 m <sup>3</sup>                 | 28 m <sup>3</sup>                  | 17 m <sup>3</sup>                 |
| Minimum SV per tree where soils shared             | 30 m <sup>3</sup>                 | 18.5 m <sup>3</sup>                | 11 m <sup>3</sup>                 |
| Allowable shared soil volume                       | 15 m <sup>3</sup>                 | 9.5 m <sup>3</sup>                 | 6 m <sup>3</sup>                  |

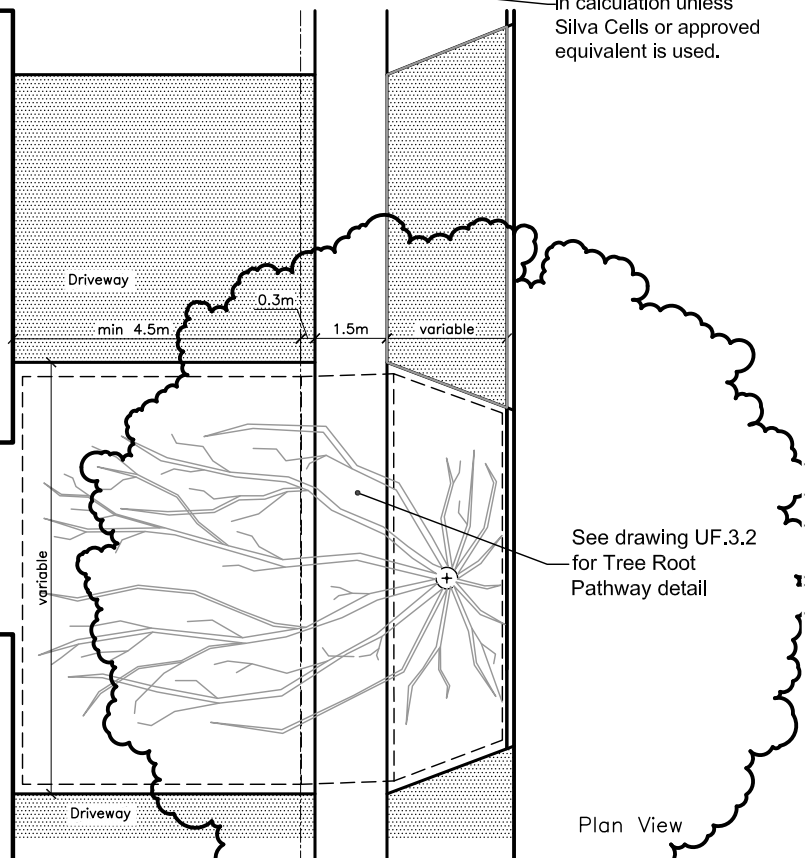
| Minimum Soil Depths for Residential Street Tree Plantings |                          |                 |
|-----------------------------------------------------------|--------------------------|-----------------|
|                                                           | Boulevard with utilities | All other areas |
| Restored Soil Depth                                       | 0.45 m                   | 0.90 m          |
| Soil Depth Will Not Exceed 1 m                            |                          |                 |



**NOTE:**  
This detail shows a typical design where the tree is planted in the boulevard. Where trees are planted elsewhere (e.g. flank, park) the soil area layout will vary.

Residential Unit

Residential Unit



GREEN STREETS – NEW RESIDENTIAL

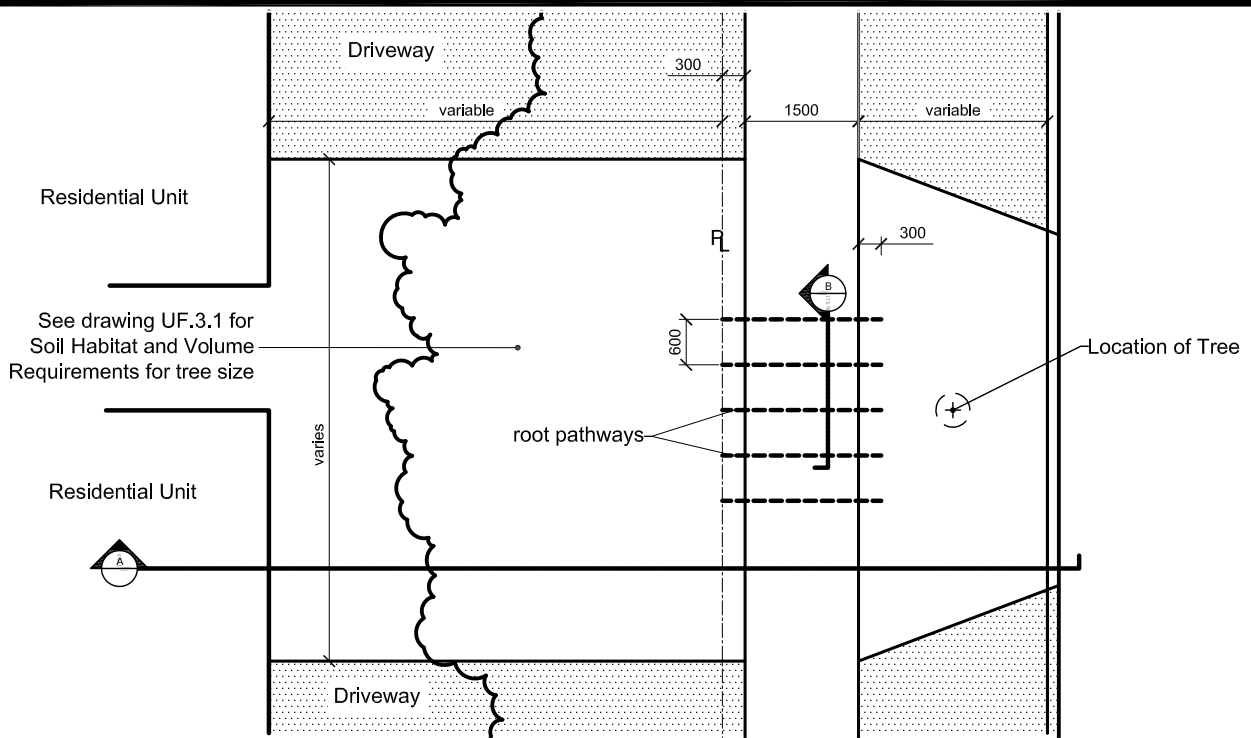
Plotted by: yvonnew Filename: S:\Secured\Design & Development\5 - AutoCAD Library\4 - Details\900 - Planting\UF.3.1 - SOIL ZONES - REQUIREMENTS.dwg



DRAWING TITLE:

**Soil Habitat Zones & Volume Requirements for Trees in Boulevards**

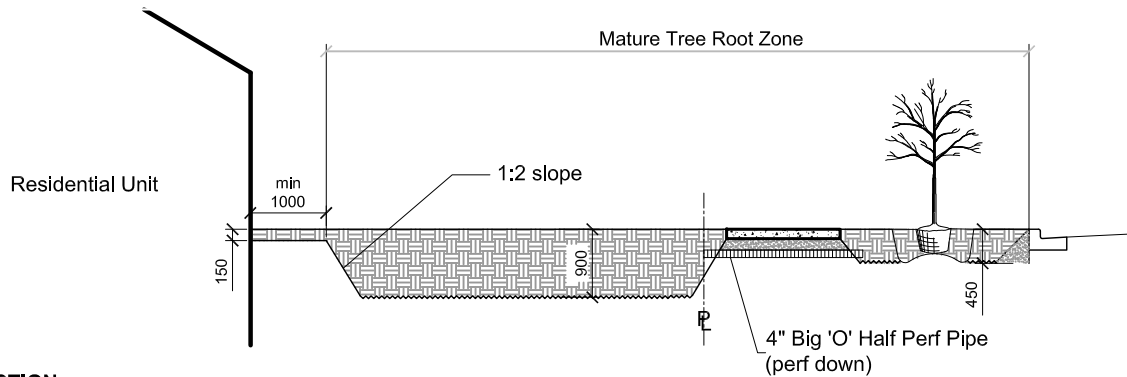
|               |                           |              |                   |
|---------------|---------------------------|--------------|-------------------|
| DESIGN<br>YWC | LAST REVISED              | SCALE<br>NTS | DWG No.<br>UF.3.1 |
| DRAWN<br>YWC  | PLOT DATE<br>May 17, 2012 | FILE NAME    |                   |



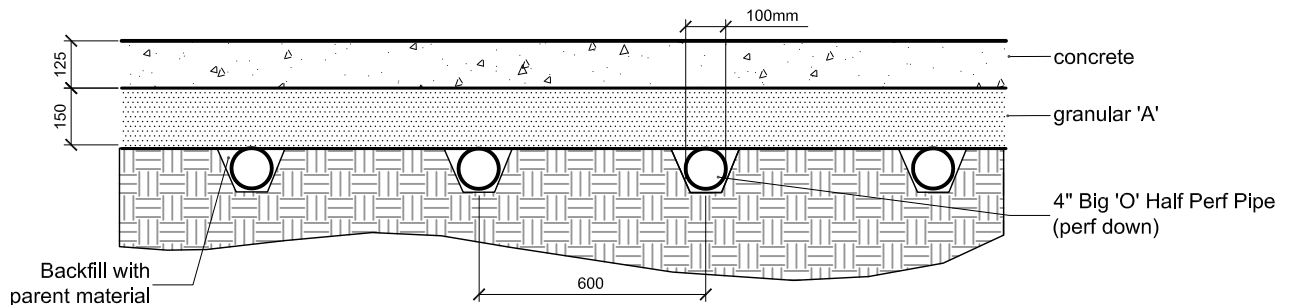
Note: A minimum of three root pathways will be accepted for small stature trees under special circumstances.



**PLAN**  
Scale 1:100



**SECTION**  
Scale 1:100



Notes: If Granular 'A' exceeds 150mm depth - excess will be removed in the root pathway area and replaced with parent material.

A minimum of five root pathways required for large and medium stature trees, while three root pathways will be accepted for small stature trees under special circumstances.



**SECTION**  
Scale 1:20

Plotted by: yvonnew Filename: S:\Secured\Design & Development\5 - AutoCAD Library\4 - Details\900 - Planting\UF.3.2 - ROOT PATHWAYS - TYPE 1.dwg



DRAWING TITLE:

**SOIL HABITAT ZONES AND ROOT PATHWAYS - TYPE 1**

DESIGN

YWC

LAST REVISED

June 01, 2012

SCALE

As Noted

DWG No.

**UF.3.2**

DRAWN

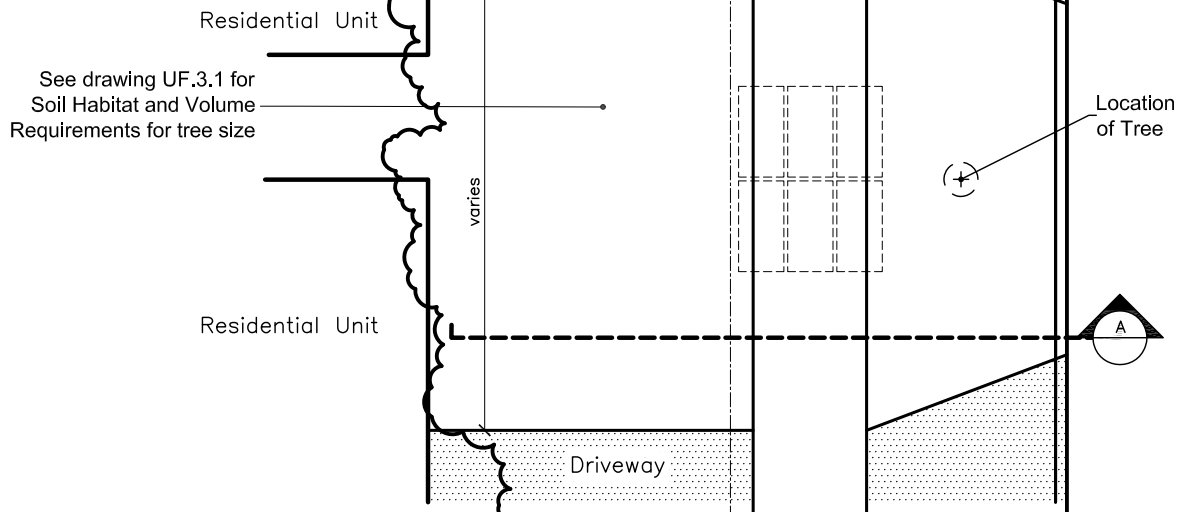
YWC

PLOT DATE

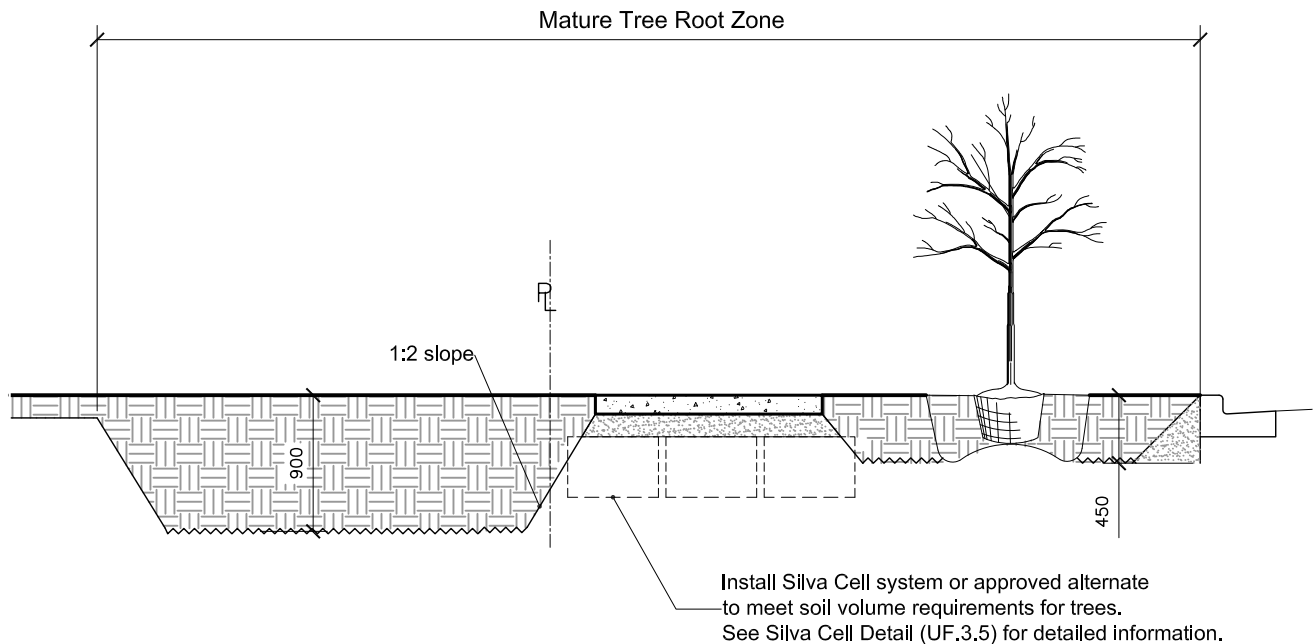
June 01, 2012

FILE NAME

Type 2 Root Pathways will be used where the soil volumes in the boulevard and front lawn are not sufficient to meet the minimum soil volume requirements for large or medium stature trees. The minimum number of required Silva Cells for root pathways below the sidewalk is six. Where lot setbacks and soil volumes are limited, Silva Cells will need to be maximized to achieve the required soil volumes. Refer to UF.3.1 for required soil volumes.



**PLAN**  
Scale 1:100



**A SECTION**  
Scale 1:50

Plotted by: yvonnew Filename: S:\Secured\Design & Development\5 - AutoCAD Library\4 - Details\900 - Planting\UF.3.3 - ROOT PATHWAYS - TYPE 2.dwg



DRAWING TITLE:

**SOIL HABITAT ZONES AND ROOT PATHWAYS - TYPE 2**

DESIGN

YWC

LAST REVISED

June 01, 2012

SCALE

As Noted

DWG No.

**UF.3.3**

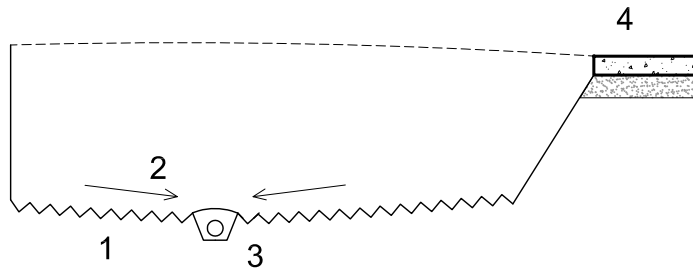
DRAWN

YWC

PLOT DATE

June 01, 2012

FILE NAME



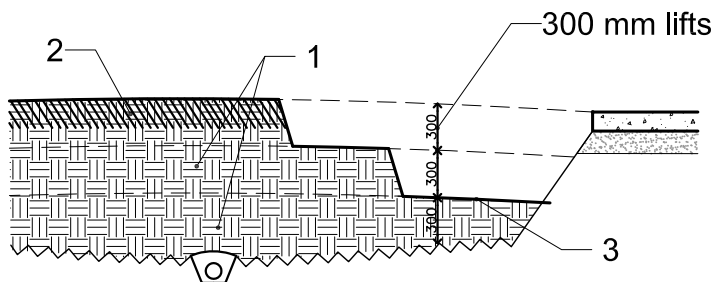
## Subgrade Preparation

1. Scarify (subgrade) parent material with a toothed blade to a depth of 100mm where there are no underground utilities.
2. Where drain lines are identified slope the subgrade to the drain.
3. Drain lines if required.
4. Slopes adjacent to infrastructure are to be 1:1.



**SUBGRADE PREPARATION** (Adapted from *Up By Roots*, James Urban, 2008)

Scale 1:50



## Soil Installation

1. 300 mm soil lifts
2. Lifts to be compacted to 80% standard proctor density.
3. Compost added to top lift (A Horizon) if specified.



**SOIL INSTALLATION** (Adapted from *Up By Roots*, James Urban, 2008)

Scale 1:50

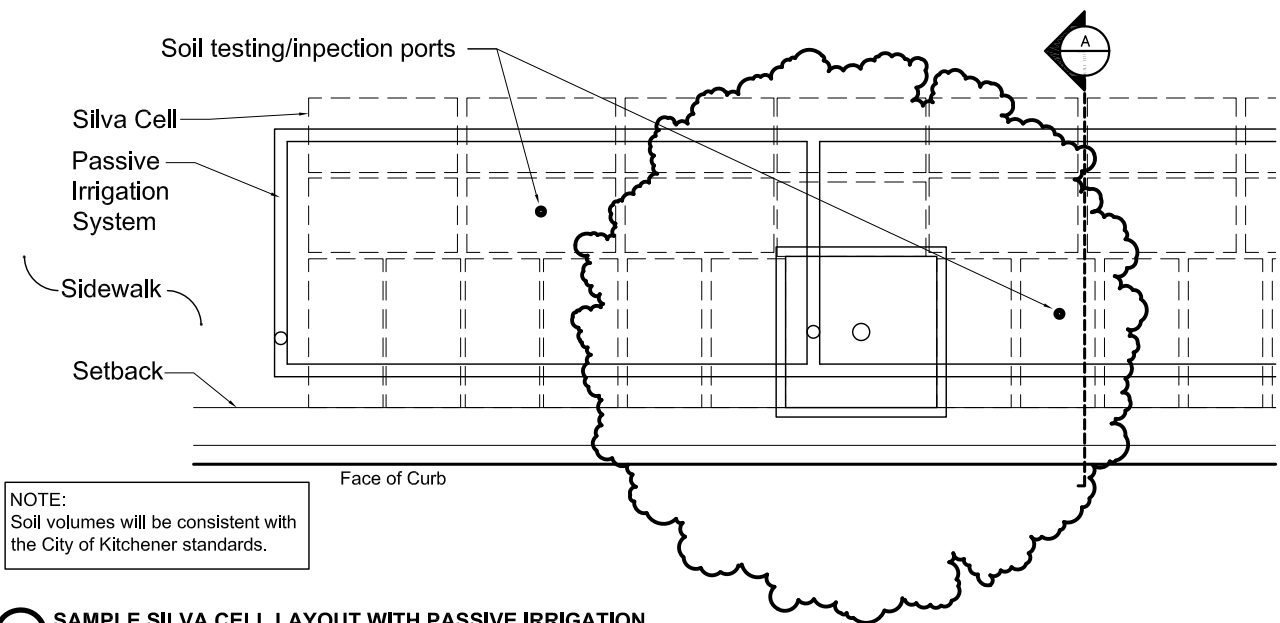
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DRAWING TITLE:

**SOIL HABITAT ZONES INSTALLATION & SPECIFICATIONS**

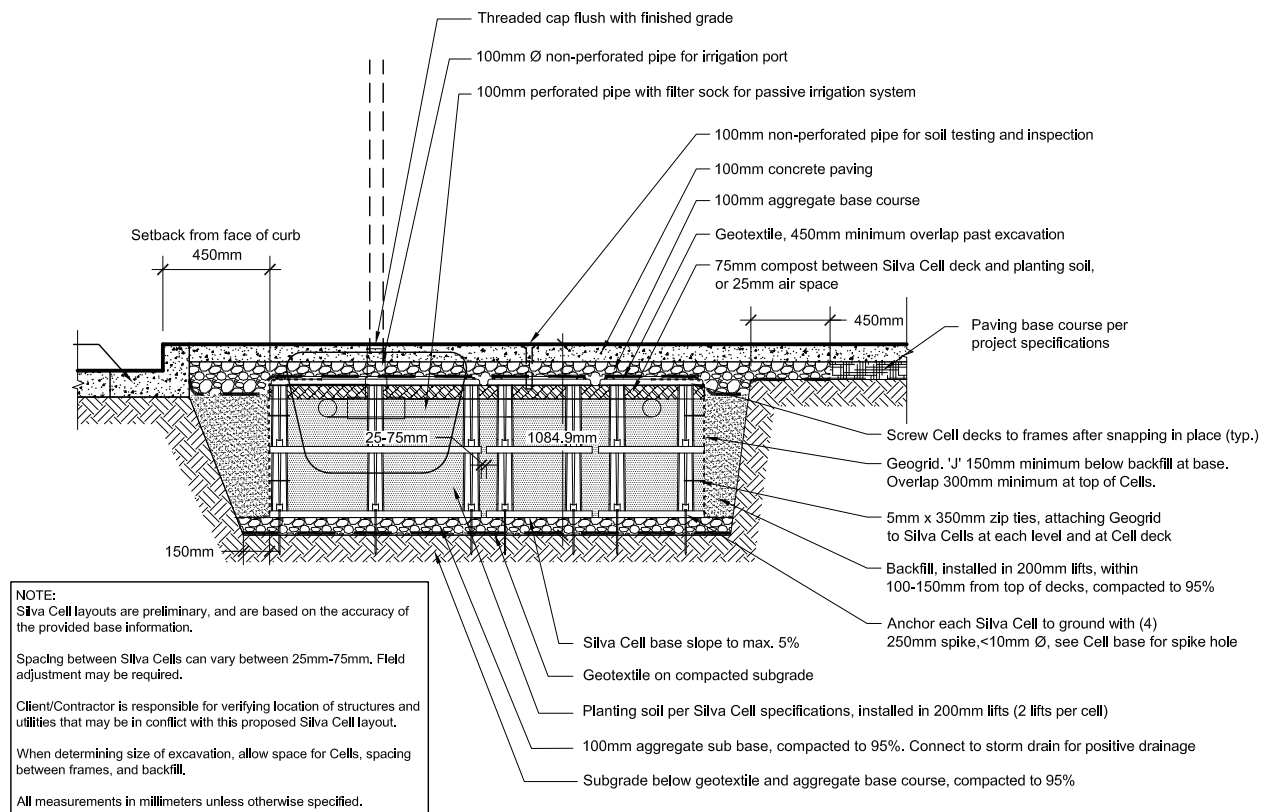
|               |                              |                   |         |
|---------------|------------------------------|-------------------|---------|
| DESIGN<br>YWC | LAST REVISED<br>May 28, 2012 | SCALE<br>As noted | DWG No. |
| DRAWN<br>YWC  | PLOT DATE<br>June 01, 2012   | FILE NAME         | UF.3.4  |



### **○ SAMPLE SILVA CELL LAYOUT WITH PASSIVE IRRIGATION**

Scale 1:200

Note: The location, size and design of the passive irrigation system, and soil testing/line inspection port shall be determined by the Project Designer and Irrigation Consultant, and approved by Operations. All irrigation systems will be approved by Operations staff and will be consistent with current City of Kitchener Operations standards.



### **Ⓐ SECTION**

Scale: N.T.S.

This detail has been provided by Deep Root, with minor modifications. All Silva Cell designs will be reviewed and approved by Deep Root and City of Kitchener Operations staff.

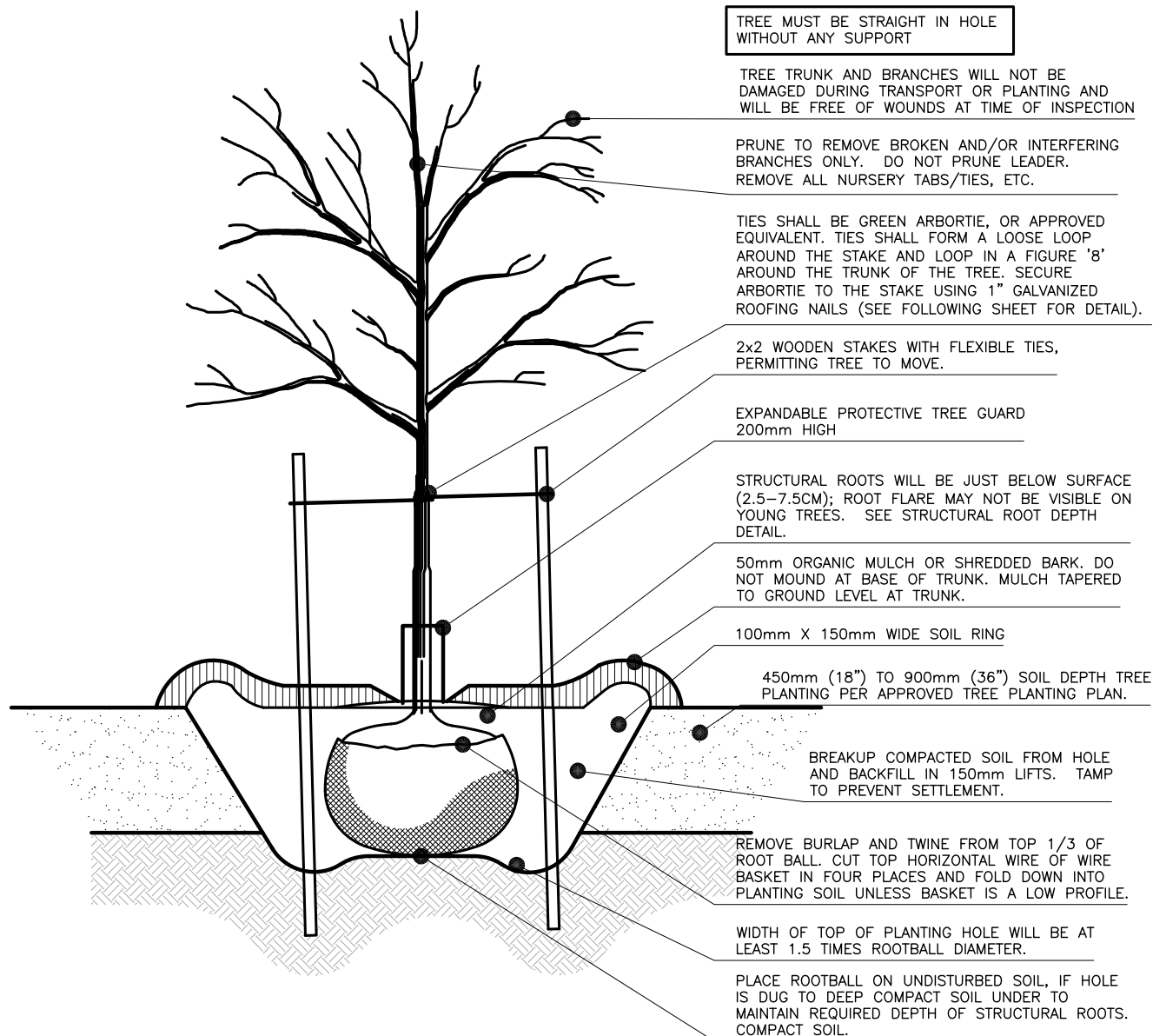
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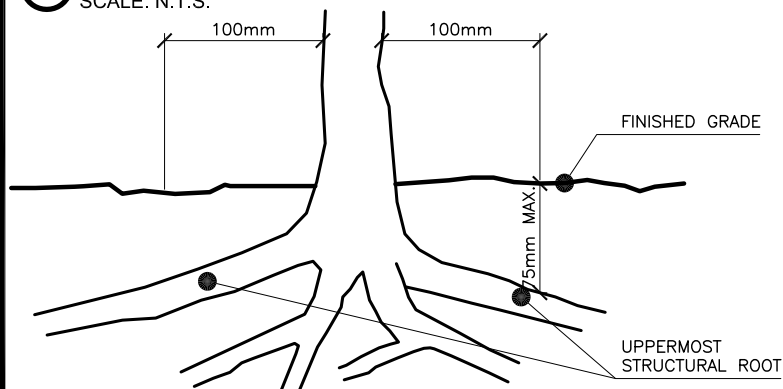
DRAWING TITLE:

### **SOIL HABITAT ZONES AND SILVA CELLS**

|                            |                                      |                          |                          |
|----------------------------|--------------------------------------|--------------------------|--------------------------|
| DESIGN<br><b>Deep Root</b> | LAST REVISED<br><b>June 01, 2012</b> | SCALE<br><b>As Noted</b> | DWG No.<br><b>UF.3.5</b> |
| DRAWN<br><b>YWC</b>        | PLOT DATE<br><b>June 01, 2012</b>    | FILE NAME                |                          |



**A DECIDUOUS TREE PLANTING DETAIL**  
SCALE: N.T.S.



**B STRUCTURAL ROOT DEPTH DETAIL**  
SCALE: N.T.S.

**STRUCTURAL ROOT DEPTH**

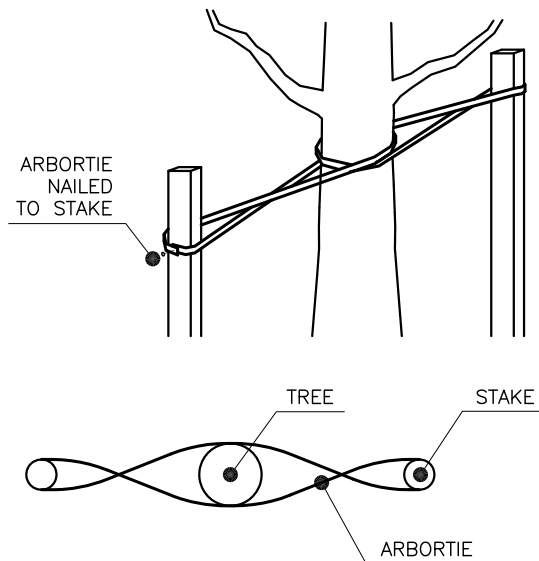
Depth of roots at planting time is critical. It cannot be assumed that structural roots will be near the top of B&B stock. All B&B or tree container stock is to be planted so that the uppermost structural roots are within 2.5 to 7.5 cm when measured 10 cm from the trunk. The location of structural roots will be determined prior to the excavation of any tree planting holes are dug to ensure that the proper depth of the planting hole is achieved. Once planted any excess soil will be removed to meet the above standard. If the removal of the soil would result in an unstable root ball the tree is not be planted and there will be no charge to the City for its replacement. At no time is this process to result in the exposure of the structural roots, and/or the root ball being planted too high.

Plotted by: yvonnew Filename: S:\Secured\Design & Development\5 - AutoCAD Library\4 - Details\900 - Planting\UF.4.1 - STREET TREE-PLANTING.dwg

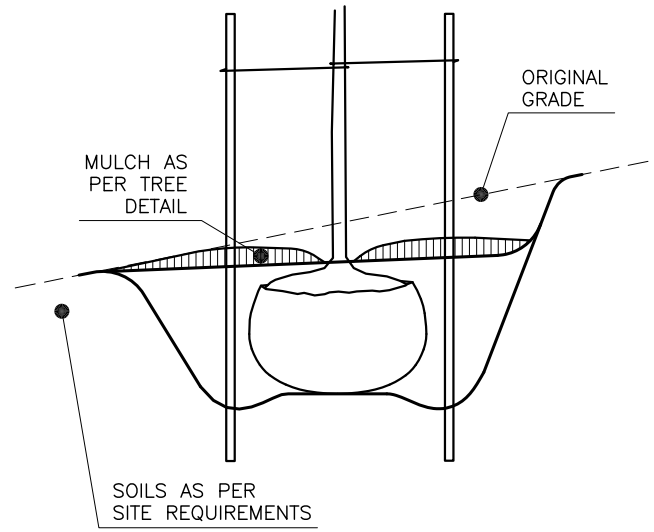
DRAWING TITLE:

**STANDARD TREE PLANTING FOR DECIDUOUS & CONIFEROUS TREES**

|                    |                           |                 |         |
|--------------------|---------------------------|-----------------|---------|
| DESIGN<br>N/A      | LAST REVISED              | SCALE<br>N.T.S. | DWG No. |
| DRAWN<br>M. PARRIS | PLOT DATE<br>May 25, 2012 | FILE NAME       | UF.4.1  |



**C TREE TRUNK TIE DETAIL**  
SCALE: N.T.S.



**D TREE PLANTING - SLOPE DETAIL**  
SCALE: N.T.S.

#### TREE PLANTING DETAILS

1. DAMAGED TREES, TREES WITH POOR FORM OR ROOT STRUCTURE AND TREES NOT MEETING THE CANADIAN STANDARDS FOR NURSERY STOCK WILL BE REFUSED. THE CONTRACTOR IS ALSO RESPONSIBLE TO ENSURE THAT ALL PLANT MATERIAL, INCLUDING CULTIVARS AND TREE SIZES ARE PROVIDED AND INSTALLED AS STATED ON THIS PLAN. NO ALTERNATIVES, INCLUDING SPECIES, TREE SIZE WILL BE ACCEPTED UNLESS APPROVED BY THE COMMUNITY SERVICES DEPARTMENT.
2. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE LOCATION OF ALL UTILITIES AND OTHER OBSTRUCTIONS ABOVE AND BELOW GROUND.
3. DURING THE TRANSPORTING, STORAGE AND PLANTING OF THE TREES THE CONTRACTOR WILL USE APPROPRIATE WORK PRACTICES TO NOT DAMAGE THE TREE, OR ROOT BALL. THE CONTRACTOR WILL ALSO ENSURE THAT THE TREE DOES NOT SUFFER DROUGHT STRESS DURING THIS OPERATION.
4. ALL TWINE AND BURLAP WILL BE BIO-DEGRADABLE. IF THE TREE HAS BEEN REBURLAPED THE OUTER BURLAP OUTSIDE OF THE WIRE BASKET WILL BE REMOVED.
5. TREES WILL BE PLANTED IN ACCORDANCE TO THE PLANTING DETAIL. THE DEPTH OF THE PLANTING HOLE WILL BE DETERMINED BY THE DEPTH OF THE ROOT BALL, ENSURING THAT THE TREES STRUCTURAL ROOTS ARE 2.5 TO 7.5 CM WITHIN THE FINISHED GRADE. SEE DETAIL 4
6. A 100 MM HIGH AND 150 MM WIDE SOIL RING WILL BE CREATED AT THE EDGE OF THE TREE HOLE. EXCESS SOIL WILL NOT BE ADDED TO THE ROOTBALL, ALL EXCESS SOIL WILL BE REMOVED FROM THE SITE.
7. 50 MM OF AN ORGANIC MULCH WILL BE APPLIED TO THE SURFACE OF THE SOIL RING AND ROOTBALL. THE MOUNDING OF SOIL AND MULCH WITHIN THE ROOTBALL AND AGAINST THE TREE TRUNK IS PROHIBITED.
8. THE TREE WILL BE WATERED IMMEDIATELY AFTER PLANTING AND THE PLACEMENT OF THE MULCH, WITH THE TREE SAUCER BEING COMPLETELY FILLED WITH WATER.
9. AN EXPANDABLE TREE COVER 200MM HIGH WILL BE PLACED AROUND THE BASE OF THE TREE.
10. TWO WOODEN STAKES 50MM X 50 MM X 2 M WILL BE PLACED OUTSIDE OF THE ROOT BALL AND FLEXIBLE TIES WILL BE USED.
11. TREES NOT PLANTED TO THIS SPECIFICATION, AND NOT AT THE APPROVED DEPTH, OR TREES THAT SETTLE AFTER PLANTING WILL BE REMOVED AND REPLANTED AT THE CONTRACTORS EXPENSE. IF THE TREE BALL CANNOT BE REMOVED FROM THE HOLE INTACT TO THE SATISFACTION OF CSD, THE TREE WILL BE REPLACED AT THE CONTRACTORS FULL EXPENSE.
12. TREE TO BE WATERED AND MULCHED IMMEDIATELY FOLLOWING PLANTING.
13. TREE SHALL BEAR SAME RELATION TO FINISHED GRADE AS IT BORE TO PREVIOUS EXISTING GRADE, FOLLOWING SETTLEMENT.

Plotted by: yvonnew Filename: S:\Secured\Design & Development\5 - AutoCAD Library\4 - Details\900 - Planting\UF.4.1 - STREET TREE-PLANTING.dwg



DRAWING TITLE:

#### STANDARD TREE PLANTING FOR DECIDUOUS & CONIFEROUS TREES

|                            |                                       |                        |                          |
|----------------------------|---------------------------------------|------------------------|--------------------------|
| DESIGN<br><b>M. PARRIS</b> | LAST REVISED<br><b>March 17, 2010</b> | SCALE<br><b>N.T.S.</b> | DWG No.<br><b>UF.4.1</b> |
| DRAWN<br><b>M. PARRIS</b>  | PLOT DATE<br><b>May 17, 2012</b>      | FILE NAME              |                          |