

Landscape Design Standards

1 Introduction

- .1 The following are the University of Toronto's Landscape Design Standards. The information contained within these standards must be followed except in the following circumstances:
 - .1 If the standards cannot be applied due to existing physical limitations, the design consultant must present the information to the Manager of Design or the U of T designate and receive permission to implement an alternative solution.
 - .2 If an alternate product or system is available, the project consultant must request approval for such an alternate from the Manager of Design or the U of T designate.
 - .3 If there is a substantial cost savings to be realized by changing from a standard and the consultant is recommending such a saving, the Manager of Design or the U of T designate will consider such a request. The consultant must be requested to prove the cost savings.
 - .4 If there is a substantial life cycle cost saving, or environmental benefits to be realized by changing from a standard, the consultant must present it to the Manager of Design or the U of T designate who will consider such a request. The consultant must be requested to prove the cost savings.
 - .5 The consultant is encouraged to point out any problems with the standards, and to provide alternates that may have a significant cost savings or environmental benefits. The consultant is also encouraged to comment on the appropriateness of the standards as compared to general industrial standards.
 - .6 These standards are intended to be competitive standards. However, the consultant should understand that the University would like to lower the long term maintenance costs and achieve more permanence and environmental improvements in the products that are purchased and installed. Therefore, the University standard might be slightly higher than the normal commercial standard.
 - .7 When the design is 75% complete, the design consultant shall complete of the checklist found herein and submit it to the U of T project manager. The Categories "C " (complies) and "NC" (not complies) indicate whether or not the design is in compliance with the standard. If a "NC" is selected, the designer must indicate why in writing.

The Design Team is required to read and comply with the full Design Standard as they apply to the project. A completed copy of this checklist must be submitted by the Design Team to the University's Project Manager when the Design Development Phase is 75% complete. In all cases, if a "does not comply" has been noted, please indicate why. Attach additional sheets as necessary.

		<u>C</u>	<u>NC</u>	<u>NA</u>
2	<u>General</u>			
.1	The architects and designers must follow the principles of the "University of Toronto St. George Campus, Open Space Master Plan 1999" which are incorporated into the Landscape Design Standards. The architects and designers must ensure that, in all projects, landscaping is designed and provided as part of the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.2	In undertaking new construction and renovations the designer must preserve existing mature trees. Any project that might have an impact on a University owned or maintained tree or trees must include a report completed by a certified arborist. This report will assess the condition of the tree(s) before the project begins. The report must identify the species, condition and physical dimensions of the tree(s). The report must include a plan for the protection of the tree(s) during the project. The report must be submitted and the plan approved by the Manager, Grounds Services before any work can begin. The plan will be used to assess any damage to the trees caused by the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.3	Gateway Sites, which are identified in the University of Toronto Open Space Master Plan 1999, should be enhanced to provide distinctive and high quality environments in order to accentuate entrances to the University.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.4	The design consultant must ensure that any free standing markers are integrated into the design of new buildings and landscape. These free standing markers must conform to the University design standards on signage. The markers should be illuminated if possible and be placed away from traffic so that they are not damaged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.5	The architect, or landscape architect must ensure that bicycle storage is provided as part of all University projects (including New Buildings and Additions to Buildings) and be integrated into the building design. Bicycle storage should be provided around the perimeters of the primary open space, and at specific locations in the centre of the campus. The location should enhance the security of bicycles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.6	The bicycle stands should consist of a secure post and ring model cast into a concrete bed. At least four stands should be provided for every 100 person population. Where space permits, this number should be increased for Student Residences.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.7	Handicapped accessibility, access to handicapped parking, service areas and walkways must be integrated into the design of the overall building, the pedestrian movement system and the landscaping, in order to provide an overall barrier free finished project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

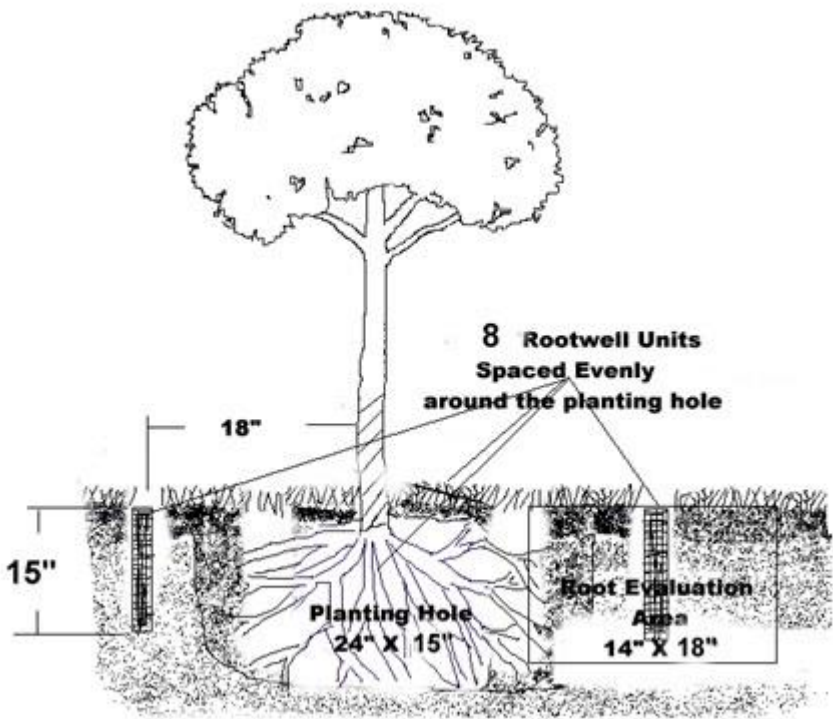
3 Plant Material and Ground Cover

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|----|--|--------------------------|--------------------------|--------------------------|
| .1 | Along with architecture, landscaping and plant material forms identify open space, modify the microclimate and through scale, texture and seasonal colour bring beauty to the University grounds. Primary plantings should be established within all the major open spaces to define the space, provide an appropriate sense of scale and bring a high scenic character to the campus. Major open spaces should be landscapes of landmark stature, distinct from plantings associated with specific buildings. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .2 | The landscape design should emphasize and consist of large scale tree cover of deciduous hardwood species that provide variety in form, foliage and fall colour. In addition evergreens and plants with attractive winter appearance should be strategically located to enhance landscape quality throughout the year. Plant species should be selected with consideration for expanding biological diversity, hardiness and longevity. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .3 | The location, layout and massing of the plants must have a regard for public and personal safety. Hedges should be avoided, or if they are to be provided, they should be low. Cedar hedges, Catoni Astor and Halls Honey Suckle must be avoided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .4 | The landscape designer should consider using mass plantings of hardy and prolific blooming perennials as bold accent plantings to create more permanent landscape features. Drought resistant or ornamental grasses should be used as accent plantings and as a low maintenance groundcover. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .5 | The range of plant material used on campus should be expanded to include native tree species that were present at the time of the University's original land grant. In addition, consideration should be given to plants that require minimum maintenance such as pesticide and water use and that provide habitats for native birds and animals. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .6 | The landscape designer should choose planting materials that reflect the seasonal colour change, to take full advantage of the changing seasons. Guidelines regarding colour, and lighting, should be applied to new landscape design to take full advantage of the changing seasons. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .7 | The plant material must conform to the horticultural standards of the Canadian Nursery Trades Association with respect to size and quality. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .8 | Any selection of species for plantings of woody or herbaceous material must be approved by the Manager, Grounds Services. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4 Trees and Shrubs

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|----|--|--------------------------|--------------------------|--------------------------|
| .1 | The trees and shrubs that are to be used must be No. 1 grade. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .2 | The trees and shrubs that are to be used must have strong fibrous root system free of disease, insects, defect or injuries and structurally sounds. The trees must have straight stems well and characteristically branched for species. Plants must have been transplanted or root pruned regularly but not later than 9 months prior to arrival on site. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- .3 Trees and shrubs must have been grown in containers for minimum one growing season but no longer than two. The root system must be able to “hold” soil when removed from container. Plants that have become root bound are not acceptable. □ □ □
- .4 In balled and burlapped trees, the size of the ball shall be proportional to the caliper of deciduous tree and to the height of the conifer. The caliper shall be measured at 150mm (6”) above ground level. A tree with 75mm (3”) caliper required root ball of 1m (40”) diameter. Increase diameter of root ball by 250mm (10”) with each increase of 25mm (1”) in caliper. Root balls of proper size must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with burlap, heavy twine and rope. Use hessian burlap. Frozen root balls will be permitted provided root balls are sufficiently protected to prevent breakage. Protect root balls from sudden changes in temperature and exposure to heavy rainfall. □ □ □
- .5 Each newly planted tree must have 4 (four) root aeration tubes installed and spaced evenly just outside the planting hole. □ □ □



Each tube must be 18” long by 3” in diameter, with a top cap 4” in diameter (installed flush to the ground) and a porous cylinder for the easy exchange of gases and water.

We recommend the Rootwell Pro-318 Deep Root system
<https://www.rootwell.com/retail-store/shop/pro-318-case-green>

- .6 Imported plant material must be accompanied by the necessary permits and import licences. They must conform to federal and provincial regulations.
- .7 Any selection of species for plantings of woody or herbaceous material must be approved by the Manager, Grounds Services.

5 Planting Time

- .1 Plant material must be approved prior to planting. Planting locations must be approved prior to excavation of planting pits.
- .2 Deciduous plants must be planted during a dormant period before buds have broken. Plant material imported from a region with warmer climatic conditions may only be planted in early spring.

6 Excavation and Stakeouts

- .1 The locations of all below grade utilities must be verified prior to excavating. The locations of utilities must be staked out in areas where excavation will occur.
- .2 For large trees and conifers, the depth of the excavation must be at least 200mm (8") deeper than height of root ball, with width of 750mm (30") greater than diameter of root ball. The size of the planting holes must be increased in heavy soils by 150mm (6") for every 300mm (12") of diameter root ball.
- .3 The bottom of the excavations must be protected against freezing. All water which enters into the excavation must be removed prior to planting. All excavated material, excavated from the planting pots and beds, must be removed off site. The subgrades of the planting beds and tree pits must be scarified to 8".

7 Planting Procedures

- .1 Planting beds and tree pits are to be backfilled with a planting mixture. The backfilling and mixing planting mix shall be done under favourable weather conditions.

- .2 Trees and shrubs must be planted vertically, in the centre of pits.
- .3 All plant material shall be planted to allow for settlement, so that the final depth will be equal to the depth originally grown in the nursery.
- .4 Trees that do not have a uniform head but are accepted by the University should be placed to give best appearance to the approval of the University.
- .5 Ensure that root balls rest on a minimum of 200mm (8") planting mix.
- .6 Topsoil must be tamped around root system in layers of 150mm (6") depth to eliminate air pockets. Frozen or saturated topsoil is unacceptable. When 2/3 of topsoil mixture has been placed, hole is to be filled with water. After water has completely penetrated the soil, complete backfill. Form a saucer around the root ball.

8 Irrigation

- 1. All flora & plant material must be properly irrigated according to industry standards. The proposed irrigation design must be reviewed & approved by the Manager, Grounds Services.
- 2. All new landscape installations and retrofits should include an irrigation component that incorporates the most recent technology in water conservation and efficient delivery methods.
- 3. Grey water and storm water run off should be used whenever possible for irrigation purposes.
- 4. All irrigation components shall be either Rainbird or Toro.

9 Sod

- .1 The grass shall be nursery sod: specially sown weed-free, and cultivated in nursery field all in compliance with the specifications latest issue of the Nursery Sod Growers Association of Ontario (B) number one Kentucky Bluegrass-Fescue Sod.
- .2 The sod is to be laid during the growing season. Sodding at freezing temperatures or on frozen ground is unacceptable. Sodding during dry weather should be avoided however, if there is no alternative it will be acceptable only if sufficient and continuous watering is assured.
- .3 The sod is to be laid with joints butted even with adjoining areas and the rows shall have staggered joints. The sections are to be butted closely without over-lapping or leaving gaps between sections. Irregular or thin sections are to be cut out with a sharp tool.
- .4 The sod is to be rolled with a light roller to ensure close contact between sod and soil. The sod is to be thoroughly watered.

10 Soil and Additives

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|----|--|--------------------------|--------------------------|--------------------------|
| .1 | The soil used for landscaping must be screened, triple mix, weed-free, friable natural loam, free of stones roots, lumps and other solid material. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .2 | Peat moss used for landscaping shall be decomposed plant material, fairly elastic and homogenous, free of decomposed colloidal residue, wood, sulphur and iron and of brown colour containing minimum 6% organic matter by weight and moisture content not exceeding 15%. Minimum pH value of peat 4.5, maximum 6.0. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .3 | Bonemeal shall be raw commercial, finely ground and with a content of minimum 4% nitrogen and 20% phosphoric acid. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .4 | Manure shall be well rotted, unleached cattle manure, free from harmful chemicals and other injurious substances, at least eight months old, but not more than two years old and with no more than 25% straw, leaves or other unacceptable materials for planting use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .5 | Limestone is to be used in all cases where the pH of the soil is less than 6.0. The lime that is to be used shall contain not less than 8% of calcium and magnesium carbonates combined, finely ground to pass a 10 mesh sieve with at least one half passing a 100 mesh sieve. Rate of application shall be determined after determining the pH of the topsoil. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .6 | Anti-desiccant: Emulsion to form permeable film over plant surfaces and mixed according to manufacturer's directions. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

11 Plant Accessories

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|----|---|--------------------------|--------------------------|--------------------------|
| .1 | The tree wrappings for trunks shall be first quality burlap. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .2 | The anchors for the support of large shrubs and trees up to 65mm (2.5") in caliper shall be new metal "T" bars 38mm x 5mm (1.5" x 1.5" x 3/16") painted black. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .3 | Eye Bolts and Turnbuckles shall be zinc coated. Turnbuckles shall be 10mm (3/8") diameter bolts for trees for 75mm (3") caliper and 76mm (0.25") diameter bolts for under 75mm. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .4 | Anchoring hoses shall be two-ply reinforced, new black rubber hose 12.7mm (0.5") in diameter. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .5 | The Mulch shall be shredded bark mulch. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .6 | The tie back wires should be zinc coated pliable steel wire, #9 gauge. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .7 | The stakes shall be T-rail iron stakes 37mm x 1.5 x 3/16") primed with on brush coat of black zinc rich paint to CGSB 1-GP-181. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .8 | Wound Dressing shall be horticulturally accepted non-toxic, non-hardening emulsion. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .9 | Rodent Protection shall be round, metal or plastic extending 24" above grade. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

12 Paving Materials

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| .1 In the design and future reconstruction of streets on the west campus, the designer should work with the University and the City of Toronto to establish a palette of materials. The sloped planter construction used on St. George Street should be avoided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .2 In the landscape design of central open spaces and in special areas of the campus, natural stone paving in combination with poured in place concrete, should be used. The chosen natural material should be available in suitable quantities, over an extended period of time, and sourced locally. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| .3 Asphalt should only be used for temporary repairs and should not be considered as a permanent material for pedestrian walkway systems. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- .4 The paving stones should be made of porous material and should be properly graded and laid with a gap to prevent water from ponding and encourage the recharge of groundwater. The paving material should have sufficient surface texture that will help prevent slipping and will assist in reducing the need for salt and other chemicals used for snow and ice control.
- .5 The foundation should be 8” properly compacted screening. The sand must be clean, sharp and free of deleterious materials. A steel edge should be used around the perimeter of the paving stones. The steel edge should be 3 mil and pre-punched to accept a mechanical fastener.

13 Seating and Furniture

- .1 Outdoor seating and street furniture should be chosen based on both the long term availability of the product and the longest life cycle available within the budget parameters. It should be integrated into the general landscape and pedestrian movement system.
- .2 The seating and street furniture should make use of recycled materials where possible.
- .3 The street furniture and seating should be designed for the comfort of the users.
- .4 Appropriate waste collection and recycling containers should be provided.

14 Walls and Fences

- .1 New walls and edges should be attractive and durable material, preferably natural stone, and should specifically exclude timbers, logs or dry, set pre-cast blocks. Wherever possible walls should include integral seating to animate the spaces. Free standing walls should not obstruct visibility or create secluded corners that may compromise personal safety. Fences should not be installed as features in the redesign of major open spaces and a program to remove existing non-historic fences should be undertaken.

15 Signage

- .1 All new open space design projects utilize the new University signage system for any naming, information or directional signage. Non-compliant signage should not be used.
- .2 Signage should be a component of the landscape design and integrated into walls, structures and planting plans where possible.

- .3 Signage and their supporting structures should be graffiti resistant and be able to withstand graffiti removal products.
- .4 Signs and posts should be designed in such a way that they can be removed for repairs

16 Outdoor Lighting

- .1 In the design of the exterior lighting the same pedestrian scale lighting fixtures should be used in both the street system and in the major open landscape spaces. The illumination levels should be consistent. The lighting levels should be maintained along a pathway, so that promise of safety and security at the beginning of a path, is maintained along its length.
- .2 Indirect lighting of important building facades and landscape features should be used to enhance the general night-time illumination level required for safety, security and visual amenity of the campus.
- .3 Site specific architectural and security lighting should be used for passageways, building entrances, courtyards and service locations. In order to maximize the use of energy, the design of the light fixtures should direct the light to the areas where it is needed.
- .4 Energy efficient and long life lamps should be used.
- .5 Illumination levels should be as recommended by IES (Illumination Engineering Society).
- .6 The lights should be controlled by reliable sensors that would turn the lights on only when natural light is insufficient for safety and security.

END OF SECTION