Green Score Guide

CITY OF SOMERVILLE
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Overview

This document—along with the accompanying Green Scorecard and Green Score Tree List—was compiled by the Division of Public Space and Urban Forestry (PSUF) and includes additional guidance, interpretation, and examples to assist Applicants with understanding and calculating the Green Score. Applicants remain subject to all provisions of the Somerville Zoning Ordinance (SZO). In the event of a discrepancy between this guide and the SZO, the SZO governs.

What is the Green Score?

- Green Score is an environmental performance standard for landscaping.
- Green Score incentivizes urban landscapes to better manage storm water, filter pollutants, reduce the urban heat island effect, provide habitat, sequester carbon dioxide, and improve air quality by awarding points to landscape elements that provide these benefits.
- Landscaping that earns a higher Green Score correlate to a higher environmental sustainability than landscaping that earns a lower score.
- Green Score includes five categories of landscape elements:
    1. *Soil*
    2. *Groundcover*
    3. *Plants*
    4. *Trees*
    5. *Engineered landscapes*
- Green Score includes ONLY landscape elements physically located within legal boundaries of the lot under development.
- Applicants experiencing minor shortfalls in achieving the required Green Score should contact the Director of Public Space & Urban Forestry to review potential solutions. In rare circumstances, the installation of street trees that may be eligible to earn Green Score credit to close minor short falls, but this exception is not otherwise provided as a means for achieving the on-site Green Score of a development proposal and only after Applicants have demonstrated the exhaustion of alternative design solutions, including wholesale redesign of the entire site.

Who does it apply to?

Green Score is triggered by the **construction of any new principal building and any substantial renovation of a principal building** (refer to the SZO for more information about applicability).

How is the Green Score Calculated?

- The landscape of a proposed development must earn the **minimum green score** required by the Zoning District of the property. Refer to the minimum green score

requirement for various zoning districts in the table below. (For example, projects in the high-rise district must achieve a green score of 0.2 or greater)

Zoning District		Min. Green Score	Ideal Green Score
Neighborhood Residential	NR	0.35	0.40
Urban Residential	UR	0.35	0.40
Mid-Rise 3 Story	MR3	0.25	0.30
Mid-Rise 4 Story	MR4	0.25	0.30
Mid-Rise 5 Story	MR5	0.20	0.25
Mid-Rise 6 Story	MR6	0.20	0.25
High Rise	HR	0.20	0.25
Fabrication	FAB	0.20	-
Commercial Core	CC	0.20	0.25
Commercial Industry	CI	0.20	-
Commercial Business	CB	0.20	-
Note: Green Score does not apply to special districts			

- Green Score is calculated by combining the weighted value of all landscape elements and dividing this number by the total land area of a lot.
- Applicants are required to provide credible supporting documentation for the Green Score credits they are claiming. Refer to supporting documentation section below.

Step-by-Step Instructions

A Green Score calculation, including Scorecard and accompanying supporting documentation, must be submitted for applicable development with the Board Review application submitted to Planning & Zoning or the Building Permit application submitted to Inspectional Services. Applicants should somervillezoning.com/developmentreview for more information.

Applicants may request a meeting or Green Score review with Staff of the Public Space & Urban Forestry Division outside of the standard arrangement of meetings included in the Board Review process or prior to submitting a building permit application for by-right development, however Staff availability for any meeting or review is not guaranteed and lack of availability does not preclude Applicants from compliance with the provisions of the Somerville Zoning Ordinance, including Green Score.

Calculating Your Green Score

Applicants are encouraged, but not required, to use the Green Scorecard calculator provided by the Public Space & Urban Forestry Division.

- STEP 1: Determine total lot area in Square Feet (SF)

- STEP 2: Calculate the area of each proposed landscape element for each category identified in the first column of Table 10.4.1. Certain types of plantings use the number of individual plants multiplied by an equivalent square footage when indicated in the second column of Table 10.4.1.

- STEP 3: Multiply the actual square footage, or the equivalent square footage, of each landscape element by the multiplier specified for each landscape element in the third column of Table 10.4.1 plus any additional bonus multiplier on Table 10.4.2 to determine the weighted score of each element.

- STEP 4: Add the weighted score of all landscape elements together

- STEP 5: Divide the resulting sum by the area of the lot to determine the final Green Score

- STEP 6: If necessary, redesign the landscape plan to achieve the minimum required Green Score.

Submittal Materials

Submittal materials will vary by project and applicants should refer to the recommended supporting documentation section below, however at a minimum, applicants are expected to submit the following:

1. Green Scorecard
2. Landscape drawings and/or specification stamped by a MA registered Landscape Architect drawn *to a legible, conventional architectural or engineering scale*. Typical drawings include but are not limited to:
    a. Existing Conditions Plan
    b. Demolition and Site Preparation Plan
    c. Layout Plan
    d. Materials Plan
    e. Grading Plan
        i. Show existing spot elevations at existing trees
        ii. Show spot elevations and slopes at hardscape areas
        iii. Show minimum 1-foot contours
        iv. Show any existing or proposed sub-surface utilities such as drainage and sewer pipes, gas lines, and electrical conduits

f. Planting Plan
    i. Show location of preserved and proposed trees
    ii. Include a planting schedule identifying, common species name, scientific species name, quantity, and minimum size
    iii. For existing trees to be preserved: show location and canopy radius drawn to scale, note DBH, genus and species, and tree protection area and fencing.
g. Details
    i. Include appropriate details for facilities relevant to Green Score such as tree protection, erosion control, tree planting, green roof, bioswale, pervious paving, etc.

3. Recent photograph(s) of any trees proposed to be "preserved"
4. Other relevant supporting documentation such as product information sheets, boring or infiltration test data, geotechnical reports, engineering calculations, etc.

Recommended Supporting Documentation

When claiming a credit, applicants shall submit supporting documentation for that credit. Supporting documentation will be considered on a case-by-case basis, but the credibility and veracity of submitted supporting documentation is solely at the discretion of the Director of Public Space and Urban Forestry. The table below outlines typical supporting documentation applicants should submit for each category.

Soils	
Credit	**Recommended Supporting Documentation**
Landscaped area with a soil depth < 24 inches	Existing condition to remain: boring, test pit, or similar evidence attesting to depth and character of topsoil Proposed condition: detail and/or specification showing depth of topsoil and intent for importing clean topsoil or amending on-site soils to meet the requirement
Landscaped area with a soil depth => 24 inches	Existing condition to remain: boring, test pit, or similar supporting documentation attesting to depth and character of topsoil Proposed condition: detail and/or specification showing depth of topsoil and intent for importing clean topsoil or amending on-site soils to meet the requirement
Pervious Paving with 6 to 24 inches of subsurface soil or gravel	Detail, specification, and/or soil infiltration test results (ASTM D3385) showing the combined depth of free draining stone material and subsoils
Pervious Paving with more than 24 inches of subsurface soil or gravel	Detail, specification, and/or soil infiltration test results (ASTM D3385) showing the combined depth of free draining stone material and subsoils

Groundcovers	
Turfgrass, mulch, and inorganic surfacing materials	Planting plan, planting schedule, and/or planting or material specification/product information sheet showing proposed landscape cover and material information
Plants	
Vegetation less than two (2) feet tall at maturity	Planting plan, planting schedule, and details showing proposed vegetation
Vegetation at least two (2) feet tall at maturity	Planting plan, planting schedule, and details showing proposed vegetation
Trees	
Small Tree	Planting plan, planting schedule, and details showing proposed vegetation
Large Tree	Planting plan, planting schedule, and details showing proposed vegetation
Preserved Tree	Existing conditions plan and photo showing tree(s) proposed to be preserved; appropriate tree protection detail and/or specification
Engineered Landscapes	
Vegetated Wall	Planting plan, planting schedule, elevation, and details showing proposed vegetated wall
Rain gardens, bioswales, and storm water planters	Planting and grading/drainage plans, planting schedule, and details showing proposed rain gardens, bioswales, and/or bio-swale planters; soil infiltration test results (ASTM D3385)
Green Roof with up to 6” of growth medium	Planting plan, planting schedule, and details showing proposed vegetated green roof
Green Roof with 6”-10” of growth medium	Planting plan, planting schedule, and details showing proposed vegetated green roof
Green Roof of 10”-24” growth medium	Planting plan, planting schedule, and details showing proposed vegetated green roof
Green Roof of over 24” growth medium	Planting plan, planting schedule, and details showing proposed vegetated green roof

Standards

The purpose of the standards in this section is to define or clarify elements eligible for Green Score credit as detailed in SZO 10.4. Each element has specific requirements for installation, configuration, and maintenance that shall be followed to maintain Green Score compliance for the life of the project.

Topsoil: friable, loamy soil above subgrade free of debris, weeds and stones, with a minimum organic matter content of 4% (by mass) suitable for growing plant material

Pervious paving: A pavement system designed to achieve water quality and infiltration benefits by allowing movement of storm water through the pavement surface and into a base/subbase reservoir. This includes porous concrete unit pavers, concrete unit pavers with porous joints, porous asphalt, and porous concrete. In the context of the Green Score, grass paver systems, flexi-pave, stone dust, and resilient poured-in-place rubber surfacing are considered groundcovers (unless the details for these systems include a sub-base stone reservoir) as these systems do not have the same stormwater detention capabilities. Areas of pervious paving with a slope exceeding 5% are not eligible for inclusion in Green Score.

For pervious pavement surfaces with open joints (e.g., pavers or blocks), a minimum of 5 inches of ASTM C-33 No. 8, 89, 9 or 57 aggregate shall be provided. This aggregate layer can be installed directly below the pavement units or as a combination of the joint filled depth and the bedding course depth as long as the total depth of aggregate is at least 5 inches.

The surface infiltration rate upon completion of the installation shall be a minimum of 100 in/hr. The in-service surface infiltration rate shall be a minimum of 10 in/hr.

Small Tree: per the SZO, a small tree is a woody plant with an expected mature height of less than thirty (30) feet. Trees not identified as acceptable small trees on the Green Score Tree List shall be adjudicated by OSPCD staff at the time of application. Per the SZO, to be counted as trees toward Green Score, new trees must be at least ten (10) feet in height or two (2) inches in caliper when planted.

Large Tree: per the SZO, a large tree is a woody plant with an expected mature height of thirty (30) feet or more. Trees not identified as acceptable large trees on the Green Score Tree List shall be adjudicated by OSPCD staff at the time of application. To be counted as trees toward Green Score, new trees must be at least ten (10) feet in height or two (2) inches in caliper when planted.

Preserved Tree: an existing, living, and healthy, non-invasive, private tree (as defined in the Tree Preservation Ordinance) that is at least ten (10) feet in height or two (2) inches in caliper. Invasive species are not eligible for this credit. Credit for a preserved tree(s) is calculated based on the preserved tree(s) total DBH. Note, a tree permit may be required if you plan to remove a living private tree, refer to the City's Tree Removal Guidelines.

Vegetated Wall: a wall comprised of plants grown in supported vertical systems that are generally attached to an internal or external wall, although in some cases can be freestanding. Vegetated walls incorporate vegetation, growing medium, irrigation and drainage into a single system. Vegetated walls are also known as living walls, bio-walls or vertical gardens. In order to be claimed as a credit for the Green Score, vegetated

walls must be oriented so as to receive a minimum of 6 hours of direct sunlight during summer months and must be irrigated.

Green Roof: a layer of vegetation planted over a waterproofing system that is installed on top of a flat or gently sloped roof. Green roofs are also known as living, vegetative, or eco-roofs. Container gardens on roofs, where plants are maintained in pots, shall not be counted as a green roof for the purpose of the Green Score. In order to be claimed as a credit for the Green Score, green roofs must be oriented so as to receive a minimum of 6 hours of direct sunlight during summer months. Intensive green roofs (with a planting medium depth in excess of 6 inches) that include tree or shrub species shall have an irrigation system.

Rain Garden: a vegetated depression generally formed on a natural slope designed to temporarily hold (retain) and infiltrate storm water runoff from the surrounding area. Rain gardens are dry most of the time, typically only holding water during and following a rainfall event. Rain gardens typically drain within 12 to 24 hours, and no longer than 48 hours. Applicants claiming this credit shall submit soil infiltration test results (ASTM D3385) showing that the native and/or design soils infiltrates water at a minimum of 1 in/hr. Rain garden vegetation should tolerate drought and flood conditions.

Bioswale: are storm water runoff conveyance channels that provide an alternative to storm sewers. Bioswales can absorb low flows or carry runoff from heavy rains to rain gardens, storm sewer inlets, or directly to surface waters. Bioswales improve water quality by infiltrating the first flush of storm water runoff and filtering the large storm flows they convey. Applicants claiming credit for a bioswale should ensure the swale meets the following requirements: side slopes are no steeper than 3(h):1(v), soil within the bioswale shall infiltrate a minimum of 0.5 in/hr, and shall at minimum convey a 10-year storm (approx. 4.3 inches in 24 hours).

Storm Water Planter: a contained vegetated area that collects and treats stormwater using bioretention. Bioretention systems collect and filter stormwater through layers of mulch, soil and plant root systems, where pollutants such as bacteria, nitrogen, phosphorus, heavy metals, oil and grease are retained, degraded and absorbed. Treated stormwater is then either retained and infiltrated into the ground as groundwater (Infiltration Planter) or, if infiltration is not appropriate, detained and discharged into a traditional stormwater drainage system (Flow-Through Planter). For infiltration storm water planters applicants claiming this credit should ensure the planter(s) meets the following requirements: a minimum of 12 inch depth free draining stone and a minimum of 18 inch depth of planting soil, an overflow tied into the storm water conveyance system, and shall planters at minimum convey a 10-year storm (approx. 4.3 inches in 24 hours). Additionally, soil within an infiltration planter shall infiltrate a minimum of 1 in/hr. Storm water planter vegetation should tolerate drought and flood conditions.

Bonus Credits

At the discretion of the Director of Public Space and Urban Forestry, landscape elements may qualify for bonus credits in addition to the standard green factor categories used to determine the green factor score.

For example:

If claiming credit for two large trees, the credit would be calculated as such:
2 (trees) x 450 (SF/tree) x 0.6 (multiplier) = ***540***

If both large trees in question were high value species, the credit would be calculated as such:
2 (trees) x 450 (SF/tree) x (0.6+0.1) (multiplier + bonus credit) = ***630***

Bonus credits are also cumulative, so if the two large, high value species trees were in a frontage area (publicly visible landscape bonus credit), the credit would be calculated as such:
2 (trees) x 450 (SF/tree) x (0.6+0.1+0.1) (multiplier + bonus credit 1+ bonus credit 2) = ***720***

Bonus Credit		
	Bonus credit applies to:	**Recommended Supporting Documentation**
Publicly visible landscape	Groundcovers, Plants, Trees, Engineered Landscapes	Landscape plan(s) showing green score landscape elements and frontage area
Native species	Groundcovers, Plants, Trees, Engineered Landscapes	Planting plan and planting schedule
High value species	Groundcovers, Plants, Trees, Engineered Landscapes	Planting plan and planting schedule
50% of irrigation is harvested rainwater	Groundcovers, Plants, Trees, Engineered Landscapes	Irrigation plan(s) including rainwater harvesting details
Food cultivation	Groundcovers, Plants, Trees, Engineered Landscapes	Landscape and planting plan(s) showing proposed area for food cultivation (with square footage identified)
De-paved lot area	Soils, groundcovers	Existing conditions plan(s) and photo(s) paved areas proposed to be removed and landscape plan(s) showing area of proposed green score landscape elements (with

		square footage identified)

Bonus Credit Standards

The purpose of the bonus credit standards in this section is to define or clarify elements eligible for Green Score bonus credit as detailed in SZO 10.4. Each element has specific requirements for installation, configuration, and maintenance that shall be followed to maintain Green Score compliance for the life of the project.

Publicly visible landscape: Green Score landscape elements that are located in a lot's "Frontage Area" (as per SZO).

Native species: a plant that is a part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem. Native plants are adapted to regional or local environmental conditions as result can be less susceptible to issues like flooding, drought, disease, and pests. They also help attract and support native wildlife. For the purpose of the Green Score, native species include any plants native to eastern North America as determined by the Director of Public Space and Urban Forestry.

High value species: tree species, as determined by the Director of Public Space and Urban Forestry that have been identified as having exemplary environmental benefits including carbon sequestration, storm water interception, energy conservation, and wildlife and pollinator value. Large and small high value tree species are identified in the Green Score Tree List.

50% of irrigation is harvested rainwater: rainwater harvesting helps reduce the consumption of freshwater, reducing the potential for drought. To claim this credit, applicants must show that on an annualized basis a minimum of 50% of the total water used for irrigation is from rainwater harvested on-site.

Food cultivation: landscape area specifically dedicated to the production of food such as in-ground garden beds and raised beds. To claim this credit, applicants must show that these landscape areas are oriented so as to receive a minimum of 6 hours of direct sunlight during summer months.

De-paved lot area: reducing paved, impervious surfaces like asphalt and concrete reduced storm water run-off—improving water quality and minimizing the impact of peak flows on the City's storm water systems. Replacing paved surfaces with landscape elements can also help reduce the impact of the urban heat island effect. This bonus credit is calculated based on the square footage of impermeable pavement being removed from the lot and replaced with a Green Score landscape element. For example:

If a lot has 1000 SF of asphalt paving, and 500 SF is being removed and replaced with 200 SF of pervious paving, 100 SF of impervious paving, and 200 SF of landscaped area, the credit would be calculated as such:

200 SF Pervious Paving with 6 to 24 inches of subsurface soil or gravel	Eligible for de-paved area bonus credit
100 SF Impervious paving	NOT eligible for de-paved area bonus credit
200 SF landscaped area with a soil depth < 24 inches	Eligible for de-paved area bonus credit

Pervious Paving:
200 (SF) x (0.2+0.1) (multiplier + bonus credit) = ***60***

Landscape Area:
200 (SF) x (0.3+0.1) (multiplier + bonus credit) = ***80***

What happens after an application is submitted?

Once a formal Green Score application is submitted, it will be reviewed and issued one of the following four decisions:

1. **Approved as Submitted –** the applicant has met the minimum green score for the mandated zoning district and has provided sufficient supporting documentation for all the credits they are claiming. OSPCD will issue a **Green Score Approval Notice**.
2. **Approved with Minor Changes** – the applicant has met the minimum green score for the mandated zoning district and has provided some/partial supporting documentation for all the credits they are claiming. Once the applicant has submitted additional required supporting documentation to satisfy the reviewer, OSPCD will issue a **Green Score Approval Notice.**
3. **Revise and Resubmit** – the applicant has either NOT met the minimum green score for the mandated zoning district and/or has NOT provided sufficient supporting documentation for all the credits they are claiming. The applicant should revise and resubmit their application based on the reviewer comments for further consideration.
4. **Denied** – the applicant has NOT met the minimum green score for the mandated zoning district and/or has NOT provided sufficient supporting documentation for all the credits they are claiming. The applicant should submit a new application based on the reviewer comments.

Questions

Questions about the Green Score should be direct to Cortney Kirk at ckirk@somervillema.gov

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