Innes Associates Ltd
40R Merrimac Street, Suite 201 W
Newburyport, MA 01950

MEMORANDUM

To	Members of the Planning and Permitting Committee Alicia Hunt, Director of Planning, Development & Sustainability Danielle Evans, Senior Planner Brenda Pike, Climate Planner
From	Paula Ramos Martinez, Senior Urban Designer/Planner
Date	September 26, 2024
Project	23146 – Medford – Zoning
Subject	Green Score
Cc:	Emily Keys Innes, AICP, LEED AP ND, President Jimmy Rocha, GIS Analyst/Data Scientist Jonathan Silverstein, Blatman, Bobrowski, Haverty & Silverstein, LLC

This memorandum contains the draft text for Green Score.

Green Score is a mandatory environmental zoning requirement, not a voluntary incentive program.

Green Score

Purpose

The purpose of the Green Score is to:

- Implement a value-based system of requirements for environmental site design that provides flexibility in meeting environmental performance standards.
- Promote attractive and environmentally functional landscapes.

Overview

The Green Score is an environmental sustainability zoning regulation that sets standards for landscape and site design to help reduce stormwater runoff, improve air quality, and keep the city cooler.

Green Score provides a weighted menu of landscape elements with the intention to be flexible and provide options that can be tailored to different building and site conditions. These landscape elements include: green roofs, rain gardens, vegetated walls, plants, among others. The minimum required Green Score needed to reach compliance differs by zoning district.

The environmental performance of each landscape element is quantified by assigning a unique multiplier to each feature. This multiplier gives landscape elements with greater environmental value a higher Green Score per square foot to account for benefits such as climate adaptation, urban heat island mitigation, air quality improvement, and stormwater mitigation. Landscaped areas that earn a higher green score correlate to a higher environmental sustainability than sites that earn a lower score.

Applicability

This section is applicable to the construction of any new principal building. **Do we want to include mayor renovations?**

Zone Districts

ZONE DISTRICT	GREEN SCORE (MIN / IDEAL)
Mystic Avenue Corridor	25 / 30

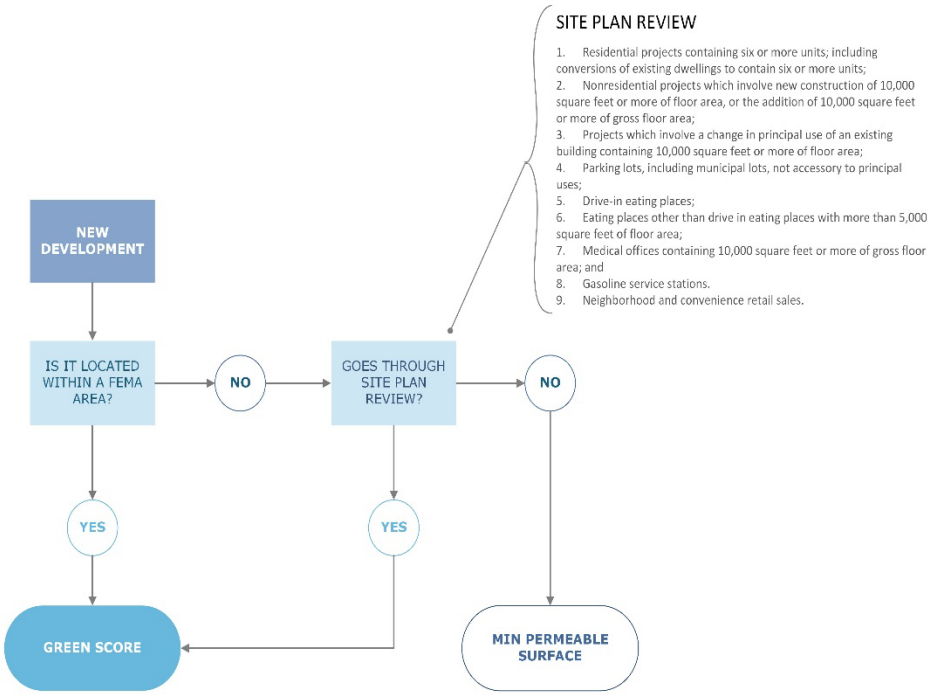
ZONE DISTRICT	GREEN SCORE (MIN / IDEAL)
Apartment 1	
Apartment 2	
Apartment 3	
Commercial 1	
Commercial 2	
Industrial	
Office	
Office 2	
Mixed use	
Mixed Use Zone	
Planned Development District	

The Green Score does not apply to the following residential districts: SF-1, SF-2 and GR. These districts must follow a Min Percentage of Pervious Surface Calculated by dividing the total area of pervious surfaces on the lot by the total area of the lot. (See chapter xx).

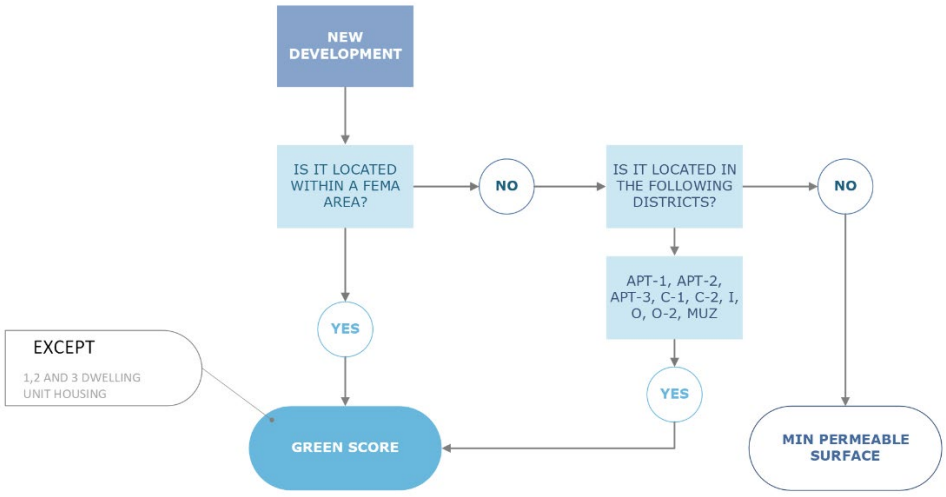
To apply Green Score to the whole district is easier. If there is not capacity, then we need to create the thresholds to apply Green Score or Pervious surface. Danielle suggested to apply Green Score to all the projects that trigger Site Plan Review.

I think that the only exception I would make is that if the project is located within a FEMA area all developments should go directly to Green Score (not only the ones triggering Site Plan Review) Always excluding residential districts.

Option A



Option B



Calculation

Green score is calculated as follows:

- Determine total lot area in Square Feet (SF). **If the lot was required to redevelop the right of way, the total area will be the sum of the lot area**

plus the area of the redesign right of way (Does this happen anywhere in Medford)

- Identify all the proposed landscape elements, sorted into the categories presented in Table xx.
- Calculate the area of each proposed landscape element or equivalent square footage where applicable. Equivalencies are presented in table xy
- Multiply the square feet, or equivalent square footage, of each landscape element by the multiplier provided for that element in table XX.
- If the landscape elements follow the conditions presented in table yy their multiplier can be summed to the element's multiplier as a bonus credit and then multiply the square feet or equivalent to the new multiplier.
- Add the weighted score of all landscape elements together.
- Divide the resulting sum by the area of the lot to determine the final green score and multiply by 100.

Table xx Eligible Landscape Elements.

LANDSCAPE ELEMENTS	MULTIPLIER
A- Planted Areas	
A1- Planted areas with a soil depth of 24 inches or more:	0.6
A2- Bioretention facilities	1.0
B- Plants	
B1- Mulch, ground covers, or other plants normally expected to be less than 2 feet tall at maturity	0.1
B2- Medium shrubs or other perennials at least 2 feet tall, but less than 4 feet tall, at maturity	0.3
B3- Large shrubs or other perennials at least 4 feet tall at maturity	0.3
B4- Small trees	0.3

LANDSCAPE ELEMENTS	MULTIPLIER
B5- Small/medium trees	0.5
B6- Medium/large trees	0.7
B7- Large trees	0.9
B8- Preservation of existing trees at least 6 inches in diameter at breast height	1.0
C- Green Roofs	
C1- Extensive vegetated roof over at least 2 inches but less than 8 inches of growth medium	0.6
C2- Intensive vegetated roof over at least 8 inches of growth medium	0.8
C3- Blue roofs	1.0
D- Vegetated Wall	
D1- Green Wall	0.3
D2- Living wall	0.1
E- Permeable paving	
E1- Installed over at least 6 inches and less than 24 inches of soil and/or gravel	0.5
E2- Installed over at least 24 inches of soil and/or gravel	0.5
F- Structural Soil	0.5

Table xy Equivalent square feet of tree canopy and large shrubs.

LANDSCAPE ELEMENTS	EQUIVALENT SQUARE FOOTAGE (SF)
B2- Medium shrubs or other perennials at least 2 feet tall, but less than 4 feet tall, at maturity	1 plant = 9 sf
B3- Large shrubs or other perennials at least 4 feet tall at maturity	1 plant = 36 sf
B4- Small trees	1 tree = 75 sf
B5- Small / medium trees	1 tree = 150 sf
B6- Medium / large trees	1 tree = 250 sf
B7- Large trees	1 tree = 350 sf
B8- Preserved trees	1 inches = 20 sf

Table yy Bonuses applied to Green Score Landscape Elements:

BONUS CREDIT	MULTIPLER
Publicly visible landscape	0.1
Native-Adaptive species	0.1
50% of irrigation is harvested rainwater	0.2
Food cultivation	0.1

Nearly every landscape element is stackable. To demonstrate how elements may be stacked, consider the illustration below. **The illustration will be added.**

General Standards

Tree and plant selection

Tree and plant selection should be based on climatic and topographic conditions as well as design criteria to ensure compatibility with the site.

Tree and plant preservation

If an applicant counts existing shrubs, perennials, groundcovers, or trees toward meeting any code requirements (including but not limited to Green Score), those planted areas must be protected during construction. Preservation must include specific protection measures and/or details on the approved plan set to ensure compliance during construction to make sure preserved trees and plants are adequately protected.

Trees and other plants bordering driveways and parking areas shall be protected from vehicles with wheel stops, curbs, or similar devices, to be shown on the approved plan set.

Invasive species

Invasive species are prohibited for new plantings. All invasive species must be removed from the development site prior to new planting. Additionally, a minimum 10’ buffer around all planted areas must be cleared of invasive species, except in portions of the buffer which extend beyond the development site.

Maintenance

All plantings and landscape elements required as part of a land use permit or building permit must be maintained by the property owner or designer for the life of the project.

When planting, ample clearance shall be provided so that plants have enough space and light, considering existing conditions on adjacent lots. All landscape improvements must be designed to allow access to conduct maintenance.

Soil and Mulch

Decompact (loosen) subsoil at a minimum of 4 inches depth (whether amended or imported soil) to produce a minimum 12-inch depth of un-compacted soil in all planting areas.

Mulch is required in all planting areas to suppress weeds, conserve water, and improve soil health. Mulch counts for credit on the Green Score if it is coarse, maintained at a depth of 2 to 4 inches, and covers the soil below shrubs and trees. Fine bark is discouraged because it can create hydrophobic conditions at the soil surface.

Landscape elements in the right of way * Applicants should be aware of building code issues involved with planting in containers or over structures: structural weight, drainage, soil mix, irrigation and maintenance, and plant selection. Irrigation and drainage are required for all container plantings for the life of the project.

Standards for Landscape Elements

The purpose of the standards in this section is to clarify what types of plantings, structures, systems, and fixtures are eligible for Green Score points. 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.

Planted areas.

Planted areas with a soil depth of 24 inches or greater

Planted areas earn credits for having a soil with a depth of 24 inches or greater in addition to earning credits for specific plants or features in the planted areas. There is no credit awarded for planted areas with less than 24 inches of soil.

Bioretention facilities

Bioretention facilities use soils and plantings to manage stormwater runoff. Bioretention facilities include but are not limited to rain or rainwater gardens, bioretention planters, or linear cells or swales. These do not include structures made of cement or concrete alone. Stormwater will pond at the surface before it filters through the underlying soil. Most water infiltrates into the underlying soil or, in places with lower infiltration rates, is collected by an underdrain and discharged to the drainage system. Stormwater that exceeds the surface storage capacity overflows to the drainage system.

Plantings

Mulch, ground covers, or other plants less than 2 feet tall at maturity

Evergreen ground covers are spreading plants typically less than 12 inches tall which provide year-round soil coverage when established. For Green Score, areas covered with evergreen perennials or shrubs less than 2 feet tall are awarded the same credit as areas covered with evergreen ground cover. Non-evergreen plants (e.g. grasses) of any height qualify as ground covers so long as they provide soil coverage year-round. Plants that die back below the soil each year do not qualify for Green Factor credit.

Medium shrubs or perennials 2 to 4 feet tall at maturity

To earn credits as shrubs or perennials, plant selections must have a mature height as specified and be non herbaceous. Otherwise, they are counted as groundcovers.

Shrubs and perennials must be at least 9 inches tall when planted;

Preserving existing trees counts for more credit than newly planted trees. Fencing and signage requirements are the same as those for tree preservation, and the protection area may not be any smaller than the drip line of affected shrubs and perennials.

Spacing between shrubs shall be at least 18 inches apart on-center.

Large shrubs or perennials 4 feet tall or more at maturity

All of the height, size, and preservation standards specific to Medium shrubs or perennials also apply to Large shrubs or perennials.

Spacing between shrubs shall be at least 24 inches apart on-center.

Trees

Size categories: for purposes of determining the size category of a tree species, the tree must have a mature canopy spread of the following:

TREE CATEGORY	CANOPY SIZE
Small Trees	8 ft to 16 ft
Small / Medium Trees	16 ft to 21 ft
Medium / Large Trees	21 ft to 26 ft
Large Trees	26 ft or more

Size at the time of installation: On private property:

Deciduous trees with one trunk must be at least 1.5 inches in diameter, measured 6 inches above the ground.

Multi-stemmed deciduous trees must have at least 3 stems and be at least 6 feet tall.

Evergreen trees must be at least 4 feet tall.

In the right-of-way, because street trees face more difficult growing conditions, DPW requires larger trees at time of installation.

In the right-of-way, deciduous trees with one trunk must be 2 to 2.5 inches, measured 6 inches above the ground. The Urban Forestry division of DPW requires that they inspect and approve street trees before planting.

Spacing: Trees on private property shall be planted no closer than the following minimum spacing:

10 feet on center between small trees

14 feet on center between small/medium trees

18 feet on center between medium/large trees

22 feet on center between large trees.

Trees in the right-of-way shall be sized according to DPW standards based on growing conditions.

Soil requirements for trees and trees in containers: Soil volume is critical to tree health and survivability. Trees and trees in containers must have a minimum of 30-inch soil depth and a minimum soil volume as follows:

TREE CATEGORY	SOIL VOLUME	AREA (30-in depth)
Small Trees	150 cu ft	6 ft x 10 ft
Small / Medium Trees	250 cu ft	10 ft x 10 ft
Medium / Large Trees	400 cu ft	10 ft x 16 ft
Large Trees	550 cu ft	11 ft x 20 ft

Trees will be healthier, bigger, and longer-lived with greater soil volume.

Smaller surface areas can achieve the same volume with greater depth if approved by the Director, or if adjacent paved surfaces are installed over structural soil or similar technologies.

Preserving trees: Every development that is proposing to protect trees must include locations and dimensions of the basic tree protection area for all trees six inches or more at standard height to be retained, whose basic tree protection areas would be affected by proposed construction. The basic protection area for trees to be preserved is generally considered to be the area within the dripline and is a no-disturbance area.

Plans must demonstrate avoidance of all proposed construction impacts and all tree protection measures.

Green Roofs

Green roofs are plantings on top of a structure at least 10 feet above grade with at least 2 inches of soil, including extensive green roof systems and rooftop gardens. Green roof planting areas that are drought-tolerant are eligible for the drought-tolerance bonus credit.

Green roof vegetation is not eligible for groundcover credits, but rooftop vegetation taller than 2 feet at maturity (shrubs, perennials, and trees) may be counted for their respective credits.

Vegetated walls

Vegetated walls are vertical surfaces covered by plants. Climbing vines with vertical structural support and living walls with built-in-place growing media are design approaches that achieve credit as vegetated walls. Vegetated walls allow sites to gain credit using minimal site area.

Maximum calculated vertical dimension must not exceed 30 feet unless the vegetated wall features built-in growth medium and irrigation.

To establish successfully, vegetated walls need soil and light. Vegetated walls planted at grade (i.e. where planting medium is not incorporated into the vegetated wall structure) earning credit must include planting medium at least 24 inches deep, with surface dimensions no smaller than 12 inches in any direction.

Vegetated walls earning credit must include dedicated irrigation for the life of the project as well as drainage suitable for the specified plant species.

The walls shall be at least five feet (5 ft.) from a side or rear lot line.

Permeable pavement

Permeable pavement allows water to pass through voids in the paving material or between pavers while providing a stable, load-bearing surface. Porous asphalt and pervious concrete allow water infiltration. Permeable interlocking concrete pavers can also be used if they are installed with gaps between them to allow stormwater to infiltrate into the subsurface.

Green Score applicants receive credit for the total area of all permeable pavement.

Permeable pavement in the right-of-way can be counted for credit and requires an DPW approval.

Grass pavers, Reinforced Turf, Flexible Porous Surface Treatment, or other similar installations, are not eligible for permeable paving credit but are eligible for ground cover credit if used in areas with low traffic volume, such as fire lanes or event parking.

Grass pavers and other similar installations cannot be counted for credit in any area used to meet parking requirements.

Permeable paving and structural soil together cannot add up to more than one third of a site's Green Score.

Structural soil systems

Structural soil systems, including CU-Structural Soil, Silva Cells, and their performance equivalents, support pavement while avoiding subsurface compaction, allowing air and water infiltration, and contributing to larger, healthier plants.

For Green Score credit, these systems must be at least 36 inches deep, under pavement, and adjacent to and continuous with root zone of one or more planting areas.

Green Score Credit is calculated by the square footage of the system's footprint.

Structural soil systems in the right-of-way must be approved by DPW.

Permeable paving and structural soil together cannot add up to more than one third of a site's Green Score.

Bonuses applied to Green Factor Landscape Elements

Any landscape feature that has claimed credit under the regular Green Score categories can also count for one or more bonus credits if it meets the criteria below. Bonus credits can apply to all landscaping, including elements provided in the right-of-way. Bonus credits cannot total more than Green Score elements subtotal.

Landscaping that consists entirely of native or adaptive plant species

Square footage for this credit is calculated as:

The area covered by drought-tolerant/native ground covers (drought-tolerant planting areas counted toward credit B.1), plus

The equivalent square footage of drought-tolerant/native shrubs and trees as calculated on the Green Score sheet (the drought-tolerant portions of credits B.2 through B.8).

50% of annual irrigation needs are met through the use of harvested rainwater or collected greywater

For each area claimed under this bonus, 50% of annual irrigation needs must be met using harvested rainwater or collected greywater.

This can be demonstrated by drainage or plumbing documents showing a water storage system.

Square footage for this credit is calculated as the area plumbed for irrigation with rainwater or greywater.

Landscaping visible from adjacent public right-of-way or public open spaces

To earn this credit, landscaping must be planted between the street-facing façade and the street right-of-way or public open spaces, where the planting medium is no higher than 15 feet above grade.

Square footage for this credit is calculated as the area covered by visible groundcovers (the visible portion of credit B.1) and vegetated walls (the visible portion of credit D), plus the equivalent square footage of all visible shrubs and trees as calculated on the Green Factor score sheet (the visible portions of credits B.2 through B.8).

Landscaping in food cultivation

Food cultivation areas are designed to grow edible plants by the residents or occupants of a building. They can be planted with annual fruits and vegetables; edible-fruit-producing perennials, shrubs, and trees; and/or nut-bearing plants.

All food cultivation areas must be easily accessible to at least some residents or occupants of a building and must have a source of water that can reach all portions of the food cultivation area.

Food cultivation areas and proposed plantings in the right-of-way are subject to approval by DPW.

Square footage for this credit is calculated as the equivalent square footage of all edible-food-producing shrubs and trees.