# Seattle Green Factor

## Code standard for livable, functional landscapes

Phase IV Terry Plaza Looking East

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Seattle Department of Planning and Development
April 2, 2014


# Overview

- Why Green Factor?
- How does it work?
- Code development and implementation
- Results so far

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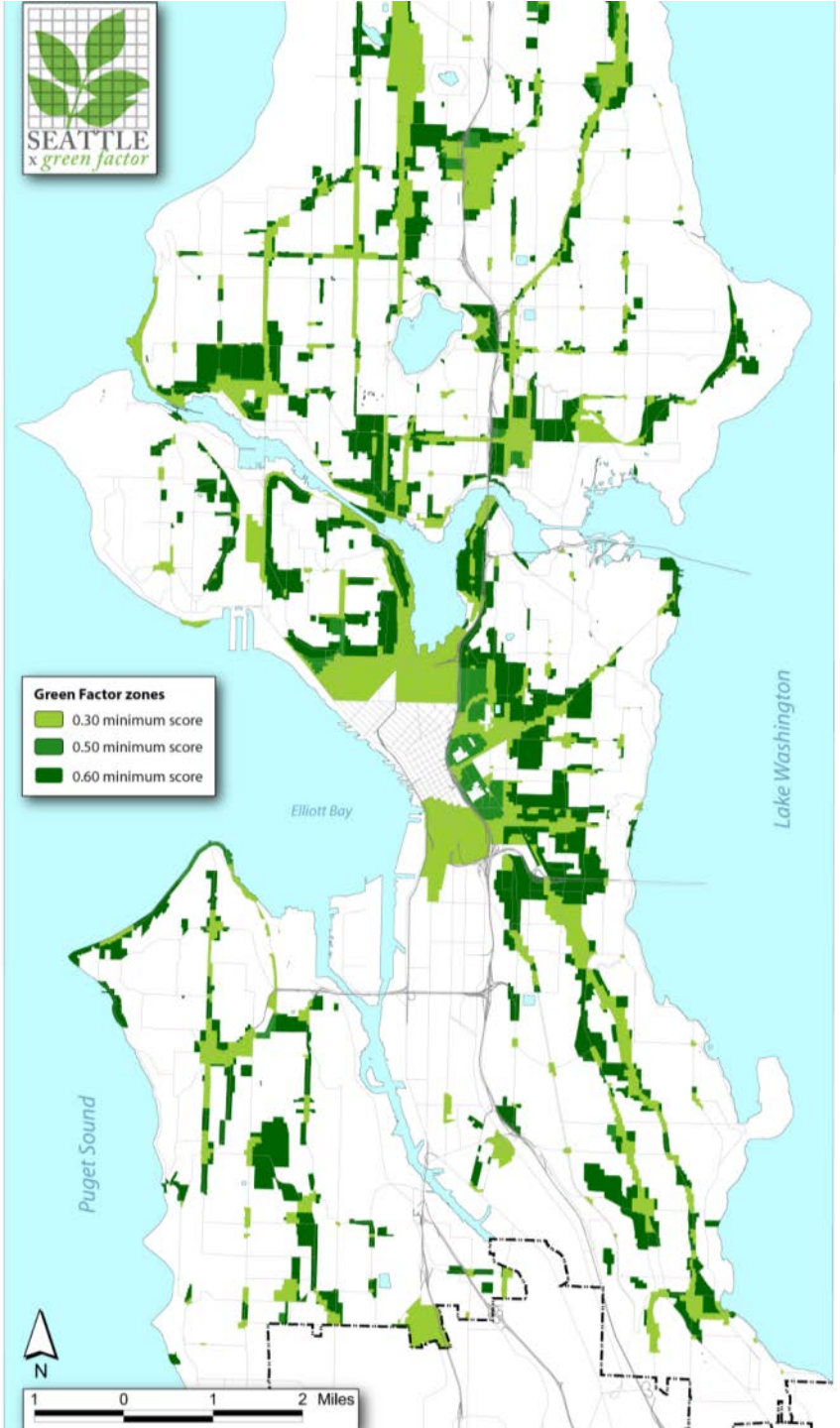


# Why Green Factor?

- Concerns about rapid growth in urban centers: balancing density and livability
- Growing awareness of ecosystem functions: stormwater and heat island
- How to treat "new" landscape features?
- 1st generation LEED: heavy on the building envelope, light on landscape

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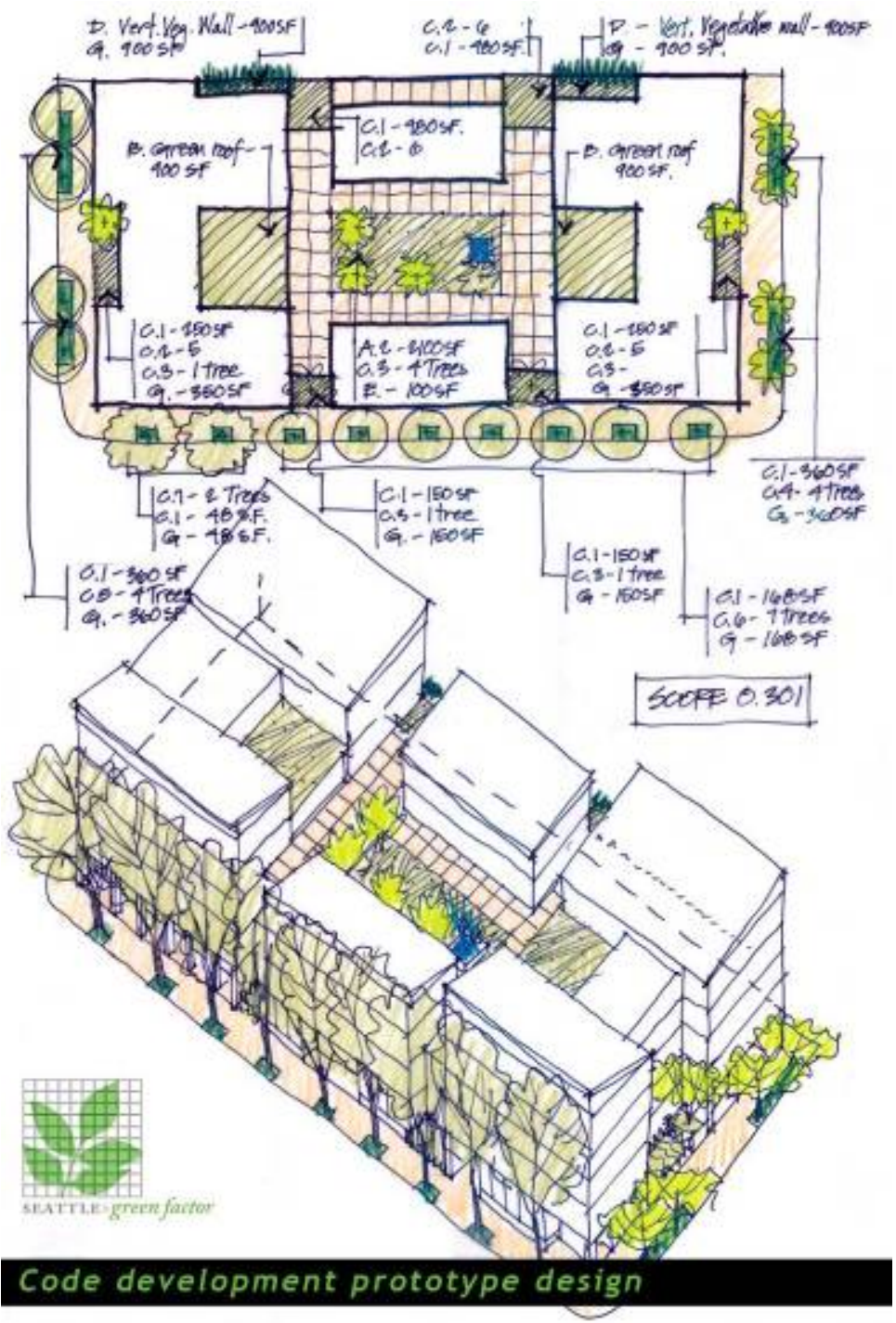


# How does the Green Factor work?

- Provides weighted menu, sets minimum score
- Includes green roofs and walls, bioretention, tree planting or preservation
- Requirement for permit approval, can “double-count” toward other requirements

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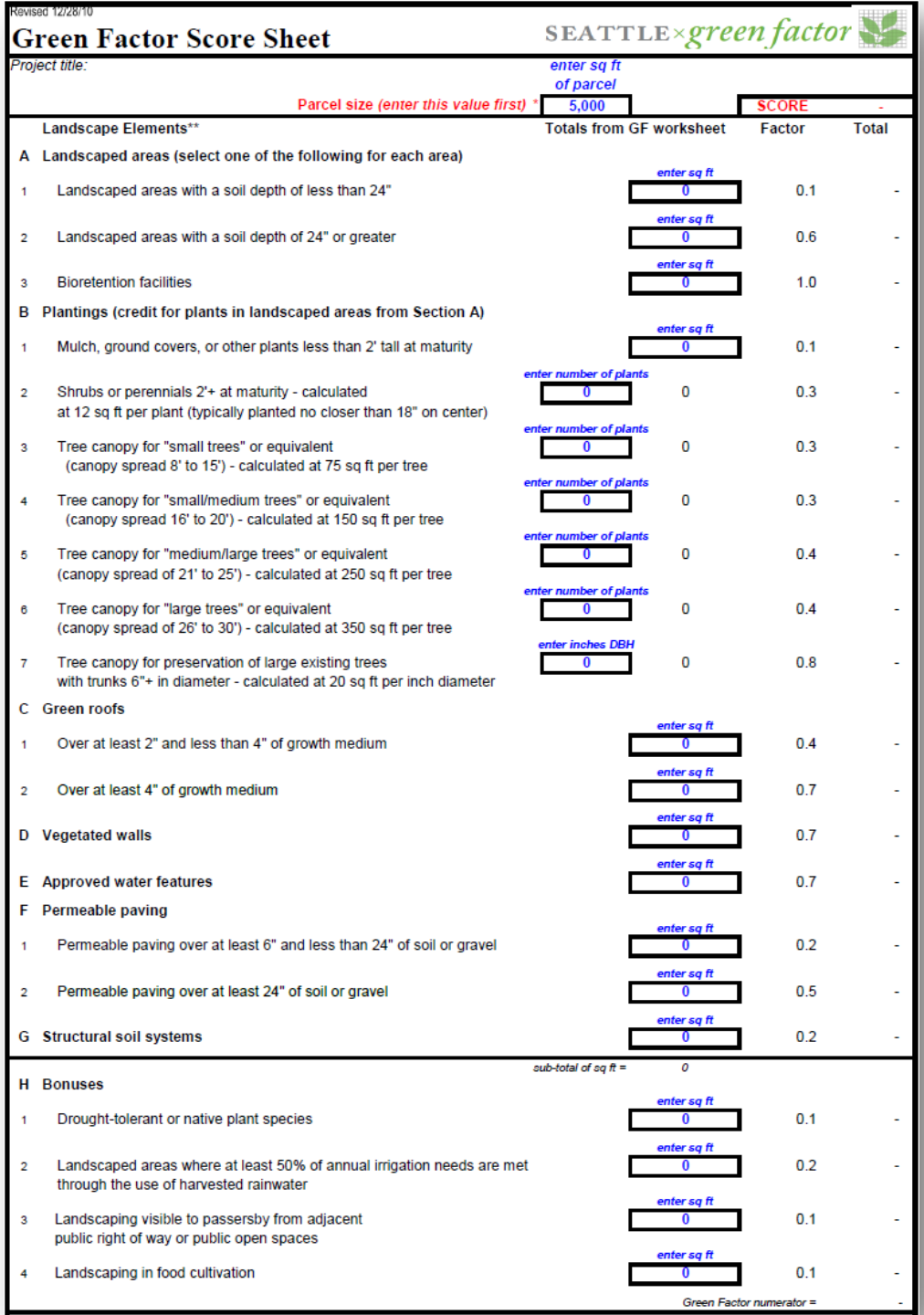

Revised 12/28/10

**Green Factor Score Sheet** — SEATTLE×green factor

*Project title:*

| | | enter sq ft of parcel | | | |
|---|---|---|---|---|---|
| | Parcel size *(enter this value first)* * | 5,000 | | SCORE | - |
| | **Landscape Elements**** | **Totals from GF worksheet** | | **Factor** | **Total** |
| **A** | **Landscaped areas (select one of the following for each area)** | | | | |
| 1 | Landscaped areas with a soil depth of less than 24" | enter sq ft: 0 | | 0.1 | - |
| 2 | Landscaped areas with a soil depth of 24" or greater | enter sq ft: 0 | | 0.6 | - |
| 3 | Bioretention facilities | enter sq ft: 0 | | 1.0 | - |
| **B** | **Plantings (credit for plants in landscaped areas from Section A)** | | | | |
| 1 | Mulch, ground covers, or other plants less than 2' tall at maturity | enter sq ft: 0 | | 0.1 | - |
| 2 | Shrubs or perennials 2'+ at maturity - calculated at 12 sq ft per plant (typically planted no closer than 18" on center) | enter number of plants: 0 | 0 | 0.3 | - |
| 3 | Tree canopy for "small trees" or equivalent (canopy spread 8' to 15') - calculated at 75 sq ft per tree | enter number of plants: 0 | 0 | 0.3 | - |
| 4 | Tree canopy for "small/medium trees" or equivalent (canopy spread 16' to 20') - calculated at 150 sq ft per tree | enter number of plants: 0 | 0 | 0.3 | - |
| 5 | Tree canopy for "medium/large trees" or equivalent (canopy spread of 21' to 25') - calculated at 250 sq ft per tree | enter number of plants: 0 | 0 | 0.4 | - |
| 6 | Tree canopy for "large trees" or equivalent (canopy spread of 26' to 30') - calculated at 350 sq ft per tree | enter number of plants: 0 | 0 | 0.4 | - |
| 7 | Tree canopy for preservation of large existing trees with trunks 6"+ in diameter - calculated at 20 sq ft per inch diameter | enter inches DBH: 0 | 0 | 0.8 | - |
| **C** | **Green roofs** | | | | |
| 1 | Over at least 2" and less than 4" of growth medium | enter sq ft: 0 | | 0.4 | - |
| 2 | Over at least 4" of growth medium | enter sq ft: 0 | | 0.7 | - |
| **D** | **Vegetated walls** | enter sq ft: 0 | | 0.7 | - |
| **E** | **Approved water features** | enter sq ft: 0 | | 0.7 | - |
| **F** | **Permeable paving** | | | | |
| 1 | Permeable paving over at least 6" and less than 24" of soil or gravel | enter sq ft: 0 | | 0.2 | - |
| 2 | Permeable paving over at least 24" of soil or gravel | enter sq ft: 0 | | 0.5 | - |
| **G** | **Structural soil systems** | enter sq ft: 0 | | 0.2 | - |
| | | *sub-total of sq ft =* | *0* | | |
| **H** | **Bonuses** | | | | |
| 1 | Drought-tolerant or native plant species | enter sq ft: 0 | | 0.1 | - |
| 2 | Landscaped areas where at least 50% of annual irrigation needs are met through the use of harvested rainwater | enter sq ft: 0 | | 0.2 | - |
| 3 | Landscaping visible to passersby from adjacent public right of way or public open spaces | enter sq ft: 0 | | 0.1 | - |
| 4 | Landscaping in food cultivation | enter sq ft: 0 | | 0.1 | - |
| | | | | *Green Factor numerator =* | - |

# Score sheet

- Enter number and/or square footage of landscape features
- Score sheet weights each feature by a factor (from 0.1 to 1.0)
- Total divided by parcel size, translates to % or Green Factor score
- Counts layers, right-of-way improvements, and various bonus credits

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# Code development


- Draft scoring system with technical experts
- Test and revise through hypothetical "retrofits"
- Fit into broader code changes through prototype designs

# Where does Green Factor apply?

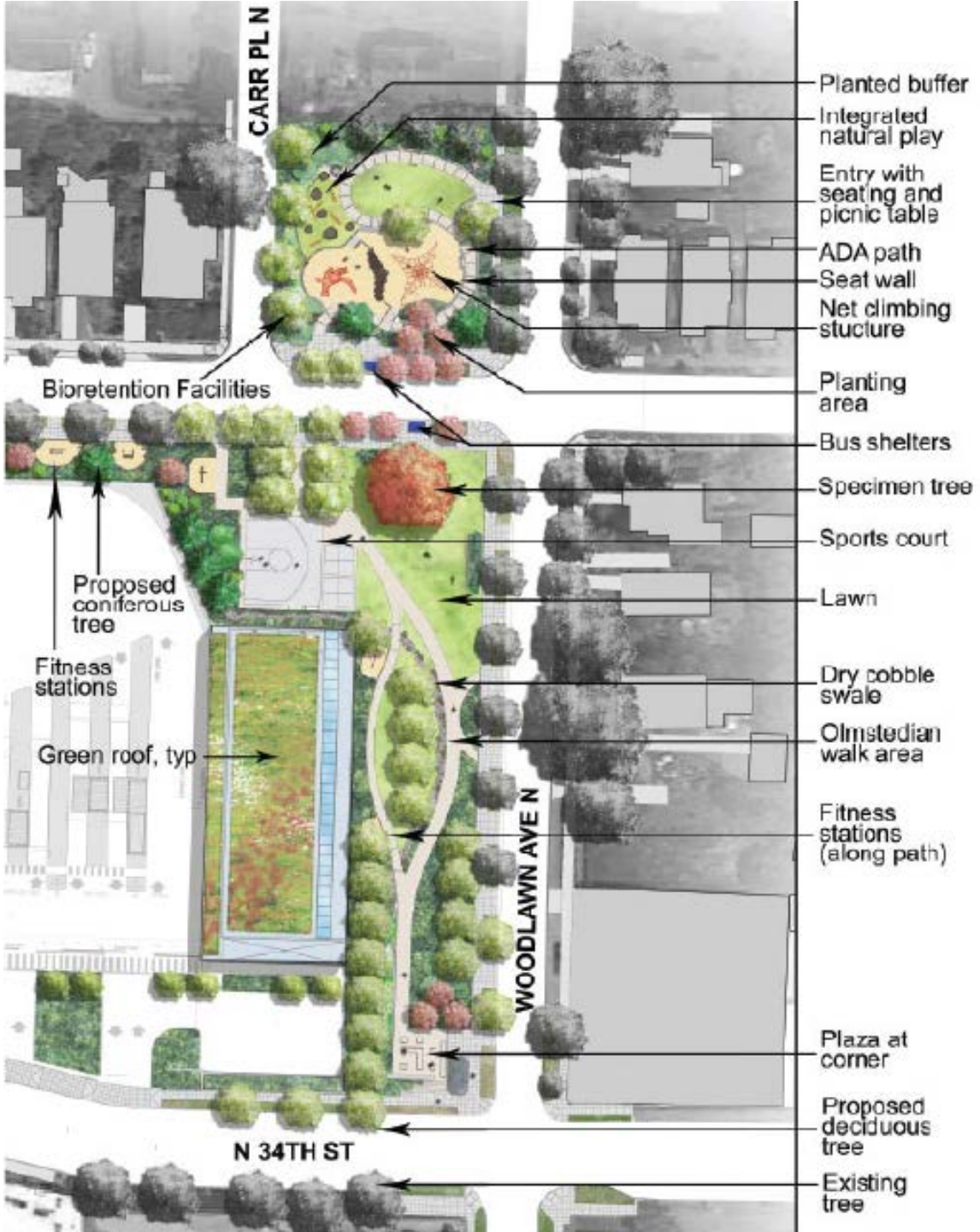
| Zone | Minimum score |
|---|---|
| Commercial & Neighborhood Commercial | 0.30 (2006) |
| Industrial Commercial (in Urban Villages) | 0.30 (2010) |
| Midrise and Highrise Residential | 0.50 (2009) |
| Lowrise Multifamily Residential | 0.60 (2010) |
| South Downtown | 0.30 (2011) |
| South Lake Union | 0.30 (2013) |

- Each time, introduced as part of broader code changes
- Same scoresheet in each zone

# Trends in built Green Factor projects

- Higher quality, better-integrated landscape design
- More layered plantings in or adjacent to rights-of-way
- Permeable paving, green roofs, and green walls
- Landscaped rooftop/terrace amenity areas


SAFEWAY


CARR PL N
Planted buffer
Integrated natural play
Entry with seating and picnic table
ADA path
Seat wall
Net climbing stucture
Bioretention Facilities
Planting area
Bus shelters
Specimen tree
Sports court
Proposed coniferous tree
Lawn
Fitness stations
Dry cobble swale
Green roof, typ
Olmstedian walk area
WOODLAWN AVE N
Fitness stations (along path)
Plaza at corner
Proposed deciduous tree
N 34TH ST
Existing tree


# Modeling benefits

UBC study found that Green Factor, applied over a 9-block area, would result in…

- 13% reduction of stormwater runoff
- 9% reduction of energy demand
- 12% GHG reduction

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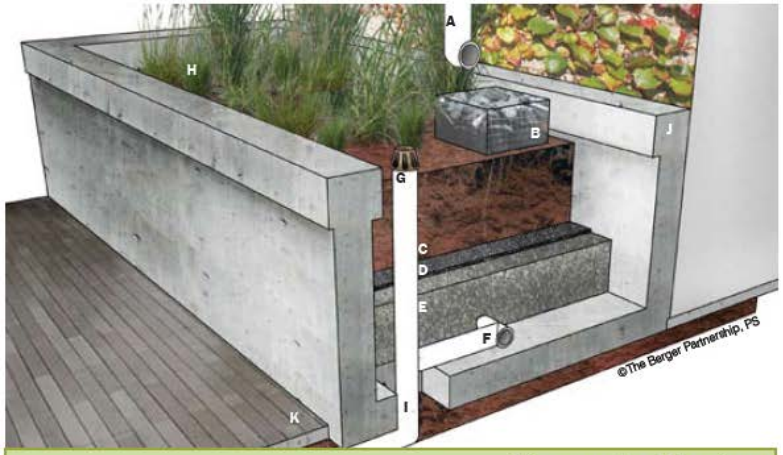
# Revisions

- Clarified score sheet
- New credits and bonuses
- Caps on permeable paving and vegetated walls
- Increased credit for trees, decreased for shrubs
- Director's Rule provides details on plant materials, permit process, and installation.

The Berger Partnership PS
Landscape Architecture




## Stormwater Planters

Stormwater planters are containers designed to capture and either retain or infiltrate stormwater based on their design. The amount and frequency of water captured depends on storm events, so they should be populated with a variety of plants adapted to both wet and dry conditions. Visually they can be striking landscape features providing a high functional value. While more expensive than bioswales, stormwater planters provide many benefits and are appropriate for areas with space constraints or on structure.

**Graphic Legend**
- A=Rainwater Source
- B=Splash Block
- C=Amended Soil
- D=Filter Fabric
- E=Gravel
- F=Perf. pipe along planter bottom
- G=Overflow Drain
- H=Plantings
- I=Pipe to stormwater system
- J=Planter wall w/ waterproofing
- K=Pedestrian area

**A3**

**Element**- Stormwater Planter

**Functional Benefits**

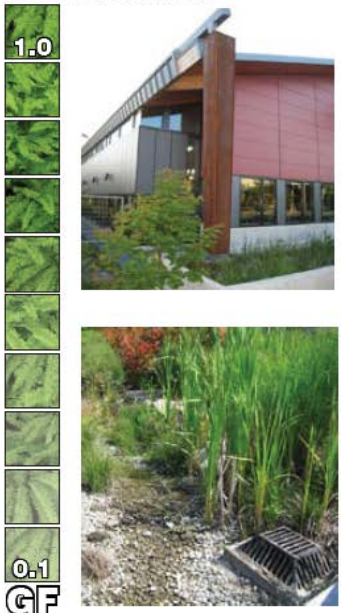
Reduced runoff

Improved runoff quality

**Environmental Considerations**

Embodied energy and carbon in concrete

**Factor** - 1.0








# tinyurl.com/ greenfactor

- Case studies: photos and landscape plans
- Score sheet
- Plant and tree lists
- Landscaping Director's Rule
- Templates & calculators
- Research

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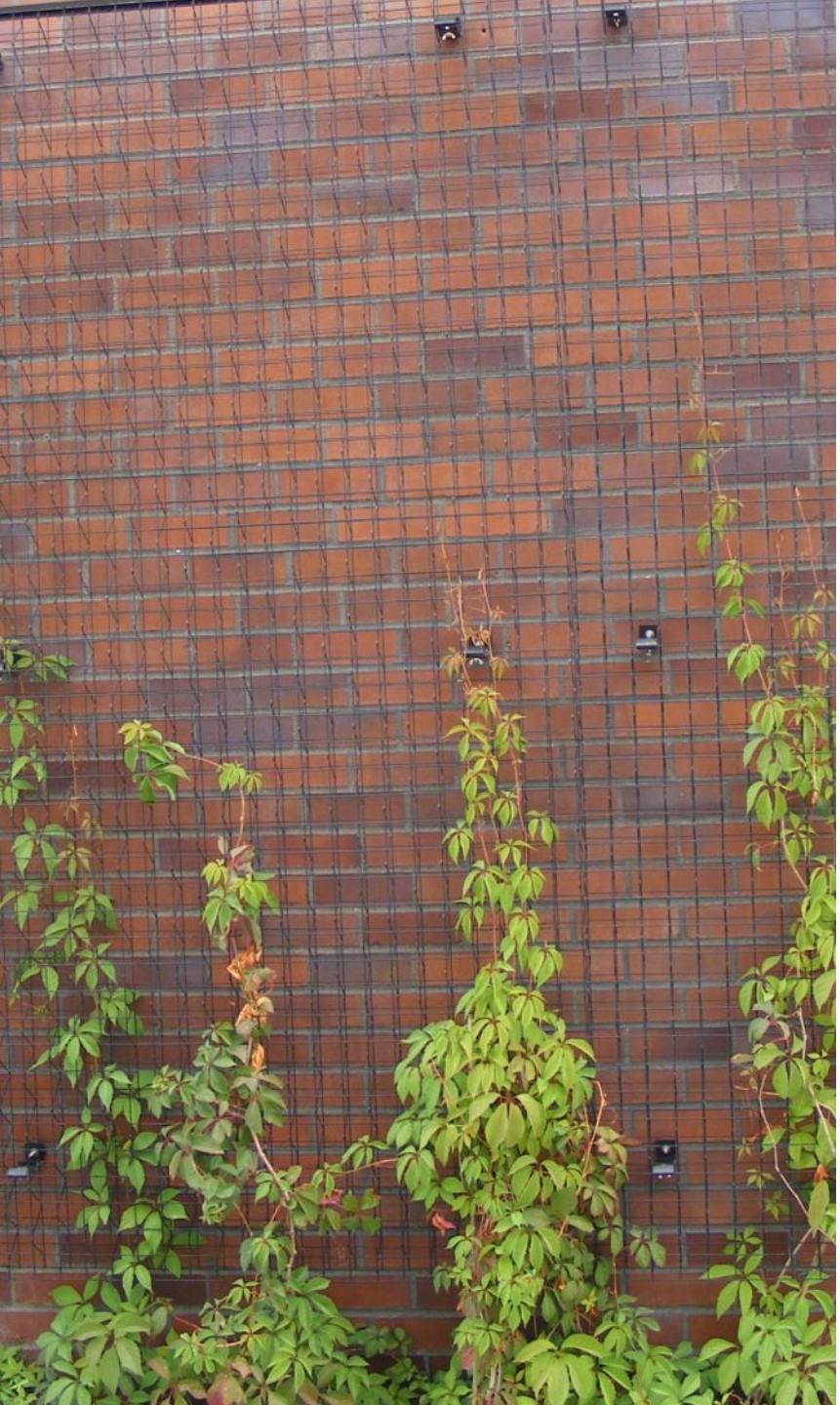

# Ongoing work

- Tracking, consistent implementation
- Quantify functional benefits
- Better align with stormwater regs
- Maintenance enforcement
- Fighting “mission creep”
- Outreach to other cities considering green factor standards

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tinyurl.com/greenfactor

# Thank you!


SvR

Beacon Hill

Recommendations Meeting

SCALE: N.T.S.

APPLICANT: BRANDON SKINNER

MATERIALS

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