Zoning Commission Public Hearing

December 20, 2010

Green Area Ratio

What is it?

- A flexible green site design requirement that varies by zone.

How Achieve?

- Choose from a range of environmental landscaping practices each of which have been assigned an environmental performance ranking.

Examples may include...

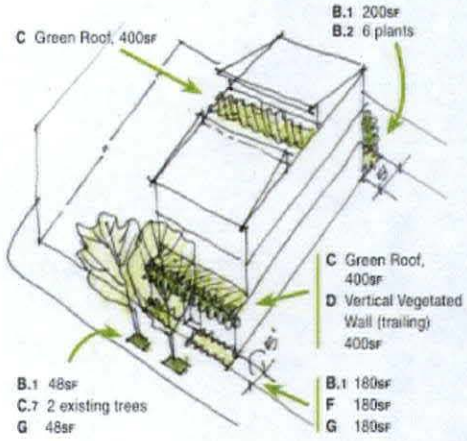
- Impermeable pavement
- Impermeable roof
- Turf grass
- Un-vegetated permeable pavement
- Vegetated permeable pavement
- Green roofs
- Natural ground cover
- Rain gardens
- Trees & shrubs
- Green facades

ZONING COMMISSION
District of Columbia
CASE NO.08-06
EXHIBIT NO.108

GAR: How Will it Work?

How to calculate:

- **Add up landscape elements by number or size**
  - # trees
  - Size of green roof
  - Size of rain garden
  - # of plants
  - Soil depths
- **Divide by lot area**
- **= GAR score**



SCORE: 0.365

GAR Chapter Text

Green Area Ratio Chapter

1300. Introduction to GAR Regulations
1301. Relationship to Land Use subtitles
1302. Applicability of GAR standards
1303. Calculation of GAR
1304. Landscape element eligibility conditions
1305. Submittal requirements
1306. Special exceptions
1307. Maintenance requirements

1300. Introduction to GAR regulation

- Explains what the GAR is
  - "*Green Area Ratio* (GAR) is the ratio of the weighted value of landscape elements to land area. The GAR score relates to an increase in the quantity and quality of environmental performance of the urban landscape. "
- Explains why the GAR is being implemented
  - Achieve environmental performance
  - Meet city-wide environmental goals
- **No recommended changes**

1301. Relationship to Landuse Subtitles

- Explains that standards in Subtitle B are general, and that zone-specific requirements will be located in Land Use Subtitles
- **No recommended changes**

1302. Applicability of GAR Standards

- Applies to all new buildings requiring a C of O
  - i.e. no single family homes
- **Changed to: Does not apply to R-1 to R-4 zones**
- Will apply different GAR scores in different zones

1302. Applicability of GAR Standards

- Applies to all renovations over 100% assessed value
  - **No recommended change after review of other DC regulations**
- Will apply different GAR scores in different zones

1302. Applicability of GAR Standards

- Application in public space?
  - **Not recommended due to conflicts with Public Space policy and DDOT concerns**
- Will apply different GAR scores in different zones

1303. Calculation of GAR

- Info used to calculate GAR
- Landscape element options, and GAR values
- How to measure landscape elements
- Sf equivalencies for plants & trees
- Technical calculation of GAR

1303. Calculation of GAR

- 1303.1 Calculation formula

- **No recommended changes**

1303. Calculation of GAR

- 1303.2 Landscape element terms of art
  - Definition of landscape element
  - Definition of a multiplier
  - Definition of the 'area' of a landscape element

- **No recommended changes**

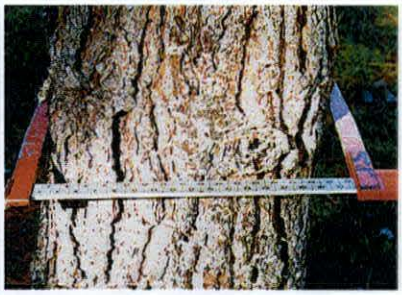
1303. Calculation of GAR

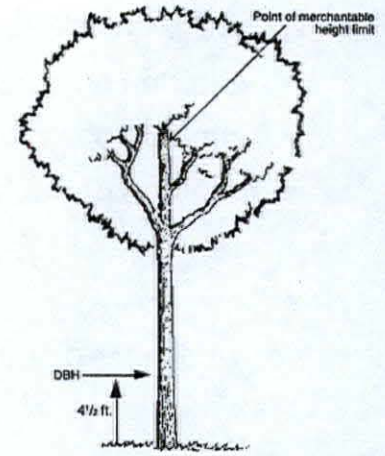
- 1303.3 - How to measure landscape elements
- 1303.4 - Intended to prevent "fully paved" lots
- 1303.5 - Counting elements twice
- 1303.6 - Meeting further requirements

- **No recommended changes**

1303. Calculation of GAR

- 1303.7
- Sq ft Values for plants & trees





Common reference points used to measure standing trees.

1303. Calculation of GAR

GREEN AREA RATIO LANDSCAPE ELEMENTS	EQUIVALENT SQUARE FOOTAGE
Plants **at least 2 feet tall** at maturity	**9 sf** per plant
Canopy: trees **2.5 - 6 in.** in diameter	**50 sf** per tree
Canopy: trees **6 - 12 in.** in diameter	**250 sf** per tree
Canopy : trees **12 - 18 in.** in diameter	**600 sf** per tree
Canopy: trees **18 - 24 in.** in diameter	**1,300 sf** per tree
Canopy: trees **> 24 in.** in diameter	**2,000 sf** per tree

1303. Calculation of GAR

- 1303.8 Measuring Landscape Elements

- **No recommended changes**

1303. Calculation of GAR

- 1303.9 Landscape elements & multipliers
- Changes:
  - **Tree diameter adjustments & credits increased**
  - **Vegetated roof credits increased**
  - **Renewable energy generation space added**

GREEN AREA RATIO LANDSCAPE ELEMENTS	MULTIPLIER
Landscaped area (select one of the following for each area)	
Landscaped areas with a soil depth of less than 24 in.	0.3
Landscaped areas with a soil depth of 24 in. or more	0.6
Bioretention facilities	0.4
Plantings	
Ground covers, or other plants less than 2 ft tall at maturity	0.2
Plants at least 2 ft tall at maturity	0.3
Tree canopy for all trees 2.5 in. to 6 in. in diameter	0.5
Tree canopy for new trees 6 in. in diameter or larger	0.6
Tree canopy for preservation of existing trees 6 in. to 24 in. in diameter	0.7
Tree canopy for preservation of existing trees 24 in. diameter or larger	0.8
Vegetated wall, plantings on a vertical surface	0.6
Vegetated roofs	
Extensive vegetated roof over at least 2 in. but less than 8 in. of growth medium	0.6
Intensive vegetated roof over at least 8 in. of growth medium	0.8
Water features (using at least 50% recycled water)	0.2
Permeable paving	
Permeable paving over at least 6 in. and less than 2 ft of soil or gravel	0.4
Permeable paving over at least 2 ft of soil or gravel	0.5
Enhanced tree growth systems	0.4
Renewable energy generation (area of)	0.5
Bonuses	
Native plant species	0.1
Landscaping in food cultivation	0.1

1304. Landscape element eligibility conditions for GAR

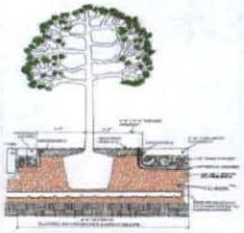
- Bioretention = rain gardens, **updated to include Baysavers**
- Trees – no change
- Vegetated walls – further specifics on how to measure, **additional clarification given**
- Vegetated roofs – no change



1304. Landscape element eligibility conditions for GAR

- Water features – no change
- Enhanced tree growth – **updated language**
- Native plant species – no change
- Food cultivation – no change
- Stormwater irrigation – no change






1305. Submittal Requirements for GAR

- 1305.2 Requires certified landscape experts
  - Suggestions for additions or changes to list?
- Submit landscape plan with typical elements
- Flexibility for weather, seasons, reasonable changes

- **Worksheet removed, due to confusion**

1305. Submittal Requirements for GAR

- 1305.2 Certified landscape experts
  - rely on MD and VA programs

- **1305.3-1305.10 No recommended changes**

1306. Special Exception for GAR

- Allow flexibility for our historic sustainable fabric
- **Explored equivalent sustainability relief – NOT recommended;**
- **Recommendation – Calibrate by zone**



1307. Maintenance Requirements for GAR

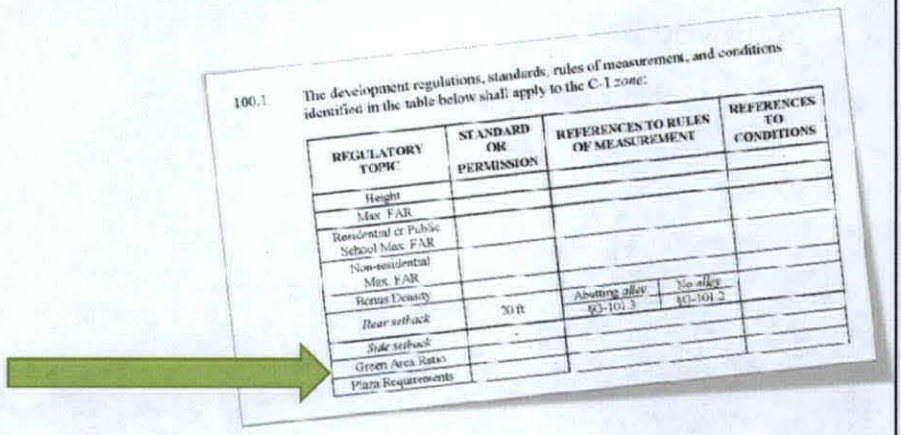
- To ensure that environmental performance is achieved
- **Additional clarity added**



Land Use Subtitle Text

Landuse Subtitles: GAR Development Standards Chart

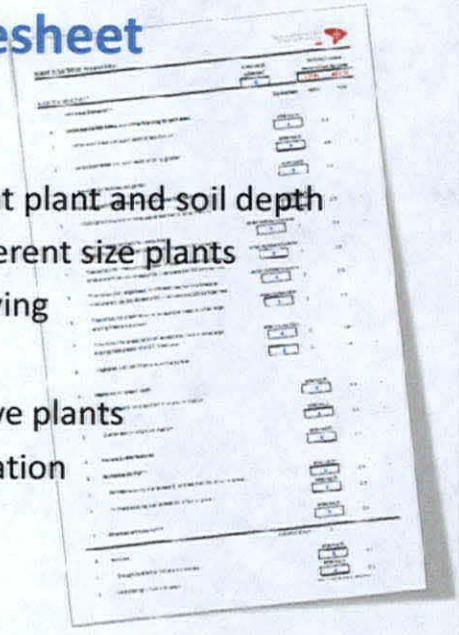
Contains: GAR for each zone



100.1 The development regulations, standards, rules of measurement, and conditions identified in the table below shall apply to the C-1 zone:

REGULATORY TOPIC	STANDARD OR PERMISSION	REFERENCES TO RULES OF MEASUREMENT		REFERENCES TO CONDITIONS
Height				
Max. FAR				
Residential or Public School Max. FAR				
Non-residential Max. FAR				
Bonus Density				
Rear setback	20 ft	Abutting alley 90-101.3	No alley 90-101.2	
Side setback				
Green Area Ratio				
Plaza Requirements				

GAR Sample Scoresheet



- Landscape elements
  - Allowed to double count plant and soil depth
  - Different values for different size plants
  - Includes permeable paving
  - Includes green roofs
  - Includes bonus for native plants
  - Bonuses for food cultivation

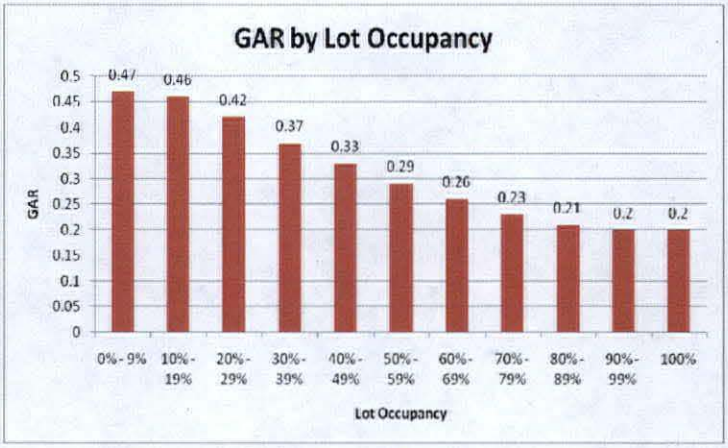
Answering the Zoning Commission's Questions

Answering ZC's Questions

- Existing Conditions Analysis -
- Cost Benefit Analysis –
- Implementation & Administration –
- Maintenance and Enforcement -
- Setting GAR levels in zones -

Answering ZC's Questions: Existing Conditions

- ~2/3 of all parcels have GARs b/t 0.2 and 0.38



Answering ZC's Questions

- **Cost Benefit Analysis –**
  - Costs to train employees
  - Costs to applicant
    - Typically cost to implement GAR less than 1% of all construction costs
- **Benefits**
  - Financial
  - Environmental

Answering ZC's Questions: Implementation & Administration

- Coordination with DCRA & DDOE

Answering ZC's Questions: Implementation & Administration

- Coordination with DCRA & DDOE

2. Building Permit Stage

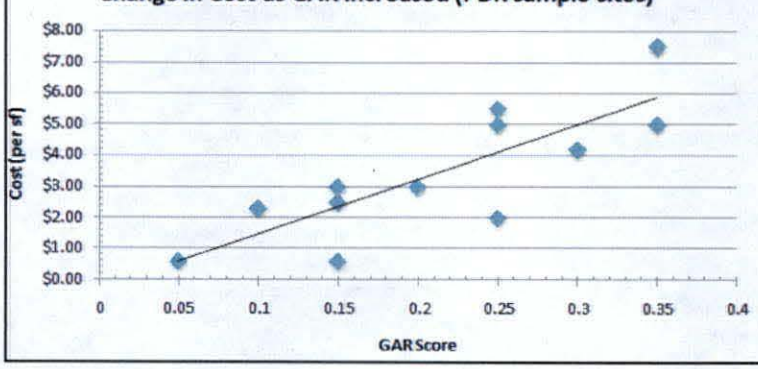
2. Applicant goes to DCRA	2.5 DCRA provides forms to DDOE
Certified Landscape Expert signs all documents	Stormwater plan reviewer checks landscape plan for GAR compliance
Submit for Review Landscape Site Plan	Stormwater plan reviewer checks GAR scoresheet for GAR compliance
Submit GAR Scoresheet	Stormwater plan reviewer checks landscape maintenance plan for feasibility
Submit Landscape Management Plan	Edits to submittals are made as necessary
	DDOE returns submittals to DCRA with approval or non-approval (Time frame: 10-30 days)

Answering ZC's Questions: Maintenance & Enforcement

- Same as PUDs and All Zoning Enforcements - Complaint-based system

Answering ZC's Questions: Methodology for setting GAR

Zone	Average GAR
C-M-1	0.156
C-M-2	0.092
C-M-3	0.036
M	0.172
Average for all PDR	0.137



Case Study Examples

Case Study: 100% Lot Occupancy Downtown 800 17th Street NW

- Zone: C-4
- Existing GAR = **0.30**
- Low green roof = **0.30**
- Thicker green roof instead = **0.40**
- Low green roof + renewable energy generation = **0.56 max**

Case Study : High Density Multi-family Residential: 900 G Street NE

- Zone: R-5-D
- Existing GAR = **0.18**
- Paved areas to permeable paving + trees = **0.36**
- Above + ½ green roof = **0.488**
- All of Above + raingarden = ≥ **0.5**

Case Study: Small scale Commercial: 1443 Howard Road SE

- Zone: C-1
- Existing GAR = **0.0**
- ½ roof with thick green roof = **0.1**
- ≤ 1/2 the paving to permeable = **0.1**
- All pavement permeable+ plants and trees = **0.26**
- Permeable paving + raingarden + plants + green roof = **0.37**

Contact

- Questions?
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