

National Association of Home Builders

# Greening Your Multifamily Project – *An Overview of the National Green Building Standard for Multifamily*

PRESENTED BY NAHB MULTIFAMILY AND THE NAHB  
RESEARCH CENTER



# **Green Building – An Architect’s Perspective**



**Only Standard Written to be  
Compatible with Building  
Codes**

**503  
LOT DESIGN**

**503.0 Intent.** The lot is designed to avoid detrimental environmental impacts first, minimize any unavoidable impacts, and mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the lot.

*(To be awarded points allocated for design the intent of the design is implemented.)*

<b>503.1 Natural resources.</b> Natural resources are conserved by one or more of the following:	
(1) A natural resources inventory is completed under the direction of a qualified professional.	5
(2) A plan is implemented to conserve the elements identified by the resource inventory as high-priority resources.	6
(3) Items listed for protection in the resource inventory plan are protected under the direction of a qualified professional.	4
(4) Basic training in tree or other natural resource protection is provided for the on-site supervisor.	4
(5) All tree pruning on-site is conducted by a Certified Arborist.	2
(6) Ongoing maintenance of vegetation during construction is in accordance with TCIA A300.	3
<b>Addition and Renovation Note:</b> Section 503.1 applies to additions that increase building footprint on the lot; and to renovations that include landscape, hardscape and outdoor living area. <i>(Additional points awarded for each strategy implemented.)</i>	<b>1 Additional Point</b>

<b>503.2 Slope disturbance.</b> Slope disturbance is minimized by one or more of the following. <i>(Points awarded only if there are developable steep slopes on the lot.)</i>	
(1) All or a percentage of development on steep slopes is avoided. (a) less than 25 percent (b) 25 percent to 75 percent (c) greater than 75 percent	2 3 4
(2) Hydrological/soil stability study for steep slopes is completed and used to guide the design of all buildings on the site.	5
(3) All or a percentage of roads and parking are aligned with natural topography to reduce cut and fill. (a) less than 25 percent (b) 25 percent to 75 percent (c) greater than 75 percent	1 3 5
(4) Long-term erosion effects are reduced through the design and implementation of terracing, retaining walls, landscaping, and stabilization techniques.	6

(5) Underground parking uses the natural slope for parking entrances.	4
<b>Addition and Renovation Note:</b> Section 503.2 applies to additions that increase building footprint on the lot; and to renovations that include landscape, hardscape and outdoor living area. <i>(Additional points awarded for each strategy implemented.)</i>	<b>2 Additional Points</b>

<b>503.3 Soil disturbance and erosion.</b> Soil disturbance and erosion are minimized by one or more of the following: (also see Section 504.3)	
(1) Construction activities are scheduled to minimize length of time that soils are exposed.	5
(2) Utilities are installed using one or more alternative means: (a) tunneling instead of trenching (b) use of smaller (low ground pressure) equipment or geomats to spread the weight of construction equipment (c) shared utility trenches or easements (d) placement of utilities under paved surfaces instead of yards	5
(3) Limits of clearing and grading are demarcated on the plan.	5

<b>503.4 Storm water management.</b> Storm water is managed using one or more of the following low-impact development techniques:	
(1) Natural water and drainage features are preserved and used.	6
(2) A storm water management plan is developed and implemented that minimizes concentrated flows and simulates flows found in natural hydrology (e.g., vegetative swales, french drains, wetlands, drywells, and rain gardens).	6
(3) All or a percentage of impervious surfaces are minimized and permeable materials are used for driveways, parking areas, walkways, and patios. (a) less than 25 percent (b) 25 percent to 75 percent (c) greater than 75 percent	1 3 5
(4) A minimum of 75 percent of the roof is vegetated (green roof).	3
<b>Addition and Renovation Note:</b> Section 503.4 applies to additions that increase the building footprint on the lot; and to renovations that include hardscape and outdoor living area. <i>(To be awarded these points, the amount of storm water runoff is not to exceed existing conditions.)</i>	<b>1 Additional Point</b>

<b>503.5 Landscape plan.</b> A landscape plan is developed to limit water and energy use while preserving or enhancing the natural environment.	
(1) A plan is formulated to restore or enhance natural vegetation that is cleared during construction. Landscaping is phased to coincide with achievement of final grades to ensure denuded areas are quickly vegetated.	5
(2) Turf grass species, other vegetation, and trees are selected that are native or regionally appropriate for local growing conditions.	4

# Details and Project Manual

<p><b>STEP 6c</b> INSTALL BUILDING WRAP OVER BUILDING WRAP AND WINDOW HEAD.</p> <p><b>STEP 6b</b> INSTALL BUILDING WRAP OVER BUILDING WRAP AND WINDOW JAMB.</p> <p><b>STEP 6a</b> INSTALL BUILDING WRAP PER MANUFACTURER RECOMMENDATION AND LEAVE 1" GAP FROM EDGE OF WINDOW FRAME.</p> <p><b>STEP 5</b></p> <p><b>WDW MOISTURE PROTECTION at SIDING &amp; STUCCO SEQ. 6</b> Scale: 1/2" = 1'-0"</p> <p>METHOD</p>	<p><b>STEP 3</b> APPLY 1/2" WIDE SELF-ADHESIVE ELASTIC FLASHING 1" PAST HEAD AND 4" PAST SILL.</p> <p><b>STEP 1c</b> <b>STEP 1b-2</b> <b>STEP 1a-2</b> <b>STEP 2</b></p> <p><b>WDW MOISTURE PROTECTION at SIDING &amp; STUCCO SEQ. 3</b> Scale: 1/2" = 1'-0"</p> <p>METHOD</p>
<p><b>STEP 5b</b> REMOVE THE 4" AREA OF NON-STICK BACKING OFF THE SELF-ADHESIVE FLASHING AND ATTACHED PER TO BUILDING WRAP.</p> <p><b>STEP 5a</b> SELF-BUILDING WRAP 4" UNDER SILL FIN FLASHING THAT WAS LEFT ATTACHED TO NON-STICK BACKING OF THE SELF-ADHESIVE FLASHING AND ATTACH HOUSE WRAP PER MANUFACTURER RECOMMENDATIONS.</p> <p><b>STEP 5</b> INSTALL BUILDING WRAP AT WINDOW SILL.</p> <p><b>WDW MOISTURE PROTECTION at SIDING &amp; STUCCO SEQ. 5</b> Scale: 1/2" = 1'-0"</p> <p>METHOD</p>	<p><b>STEP 2a</b> APPLY NP-1 SEALANT CONTINUOUSLY ALONG SHEATHING TO SEAL WINDOW FLANGES AT BOTH JAMBS AND HEAD.</p> <p><b>STEP 2b</b> INSTALL WINDOW ASSEMBLY INSIDE ROUGH OPENING MAKING SURE SEALANT MAKES CONTACT WITH FLANGES.</p> <p><b>STEP 1c</b> <b>STEP 1b-2</b> <b>STEP 1a-2</b></p> <p><b>WDW MOISTURE PROTECTION at SIDING &amp; STUCCO SEQ. 2</b> Scale: 1/2" = 1'-0"</p> <p>METHOD</p>
<p><b>STEP 4a</b> INSTALL GALVANIZED METAL FLASHING IN LINE WITH BOTTOM FACE OF WINDOW HEAD.</p> <p><b>STEP 4b</b> APPLY 4" SELF-ADHESIVE ELASTIC FLASHING OVER GALVANIZED METAL FLASHING.</p> <p><b>STEP 1c</b> <b>STEP 1b-2</b> <b>STEP 1a-2</b> <b>STEP 2</b></p> <p><b>WDW MOISTURE PROTECTION at SIDING &amp; STUCCO SEQ. 4</b> Scale: 1/2" = 1'-0"</p> <p>METHOD</p>	<p><b>STEP 1a-2</b> APPLY 1 1/2" HORIZONTAL SELF-ADHESIVE ELASTIC SILL FLASHING OVER WINDOW SILL &amp; END GAMB FLASHING RETURN 4" INTO OPENING FOR WINDOW FIN.</p> <p><b>STEP 1c</b> 4" SELF-ADHESIVE ELASTIC FLASHING CORNER PROTECTION 4" MIN. BOTH SIDES.</p> <p><b>STEP 1b-2</b> APPLY 1 1/2" SELF-ADHESIVE ELASTIC FLASHING OVER WINDOW SILL &amp; SILL FLASHING RETURN 4" INTO OPENING. NO PIN HOLES IN CORNERS. APPLY SEALANT IF PIN HOLES OCCUR.</p> <p><b>STEP 1</b> INSTALL 1 1/2" SELF-ADHESIVE ELASTIC FLASHING FOR WINDOW FIN.</p> <p><b>WDW MOISTURE PROTECTION at SIDING &amp; STUCCO SEQ. 1</b> Scale: 1/2" = 1'-0"</p> <p>08003_dwwm101-SIDING_STUCCO-SEQ-01-06.DWG METHOD</p>





**NGBS Scoring for New Construction**  
**ICC 700-2008 National Green Building Standard™**

Revised October 13, 2010

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This project has met all the BRONZE requirements

	Current Status		Performance Level Minimums			
	Score	Mandatory	Bronze	Silver	Gold	Emerald
<b>This Chapter</b>	<b>90</b>	N/A	39	66	93	119
<b>This Project</b>	<b>329</b>	Met	222	406	558	697

Practice #	Chapter 5: Lot Design, Preparation, and Development	Points Available	Points Claimed	Required Documentation	Approved Products	Notes
<b>500 - Lot Design, Preparation, and Development</b>						
500.0	<b>INTENT.</b> This section applies to lot development for the eventual construction of residential buildings, multi-unit buildings, or additions thereto that contain dwelling units. The buildings on the lot earn their own performance level by complying with the provisions of Sections 303, 304, or 305.5, as applicable.					
<b>501 - Lot Selection</b>						
501.1	<b>Lot.</b> The lot is selected to minimize environmental impact by one or more of the following conditions. <b>Claim points for all that apply from (1)-(2) below:</b>					
(1)	An infill lot is selected.	4	4	None.	--	
(2)	A greyfield lot or an EPA-recognized brownfield lot is selected.	5		Evidence that the site was a previously developed site with abandoned or underutilized structures, or an EPA map showing site is a recognized brownfield.	--	
<b>NOTE:</b> Indicate if the lot is greyfield or EPA-recognized brownfield in the Additional info box below.						
<b>Additional Info:</b>						
501.2	<b>Mass transportation.</b> A range of mass transportation choices are promoted by one or more of the following conditions: <b>Claim points for all that apply from (1)-(3) below:</b>					
(1)	A lot is selected within one-half mile (805 m) of pedestrian access to a mass transit system or within five miles (8046 m) of a mass transit station with provisions for parking.	3		Map showing location of transportation relative to the building.	--	
(2)	Walkways, street crossings, and entrances designed to promote pedestrian activity are provided. New Buildings are connected to existing sidewalks and areas of development.	3	3	None.	--	
(3)	A lot is selected within one-half mile (805 m) of <b>six or more</b> community resources (e.g., recreational facilities (such as pools, tennis courts, basketball courts), parks, grocery store, post office, place of worship, community center, daycare center, bank, school, restaurant, medical/dental office, laundromat/dry cleaner).	3	3	Map or approved site plan showing location of committed community resources relative to building.	--	
<b>NOTE:</b> List the 6 community resources in the Comments box below.						
<b>Additional Info:</b>						
<b>502 - Project Team, Mission Statement, and Goals</b>						
502.1	<b>Project team, mission statement, and goals.</b> A knowledgeable team is established and team member roles are identified with respect to green lot design, preparation, and development. The project's green goals and objectives are written into a mission statement.	4	4	Project mission statement, goals, and specific team member roles identified.	--	
<b>503 - Lot Design</b>						
503.0	<b>INTENT.</b> The lot is designed to avoid detrimental environmental impacts first, minimize any unavoidable impacts, and mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the lot. <b>NOTE:</b> To be awarded points allocated for design, the intent of the design must be implemented.					
503.1	<b>Natural resources.</b> Natural resources are conserved by one or more of the following conditions. <b>Claim points for all that apply from (1)-(6) below:</b>					
(1)	A natural resources inventory is completed under the direction of a qualified professional.	5	5	Lot specific information for: Natural resource inventory signed by qualified professional.	--	
(2)	A plan is implemented to conserve the elements identified by the resource inventory as high priority resources.	6		Conservation plan.	--	
(3)	Items listed for protection in the resource inventory plan are protected under the direction of a qualified professional.	4		Statement from professional that he/she directed plan implementation.	--	





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Bronze					
Chapter	Required Points	Claimed Points	Additional Claimed Points Above Bronze	Point Shortfall	Mandatory Status
Chapter 5: Lot Design, Preparation, & Development	39	90	51		N/A
Chapter 6: Resource Efficiency	45	81	36		Met
Chapter 7: Energy Efficiency	30	56	26		Met
Chapter 8: Water Efficiency	14	17	3		N/A
Chapter 9: Indoor Environmental Quality	36	70	34		Met
Chapter 10: Operation, Maintenance, & Building Owner Education	8	15	7		Met
<b>Section Totals</b>	172	329	157	0	
<b>Additional Points Above Bronze</b>	50		157	0	
<b>Total Points</b>	222	329		0	

**To achieve Bronze:**

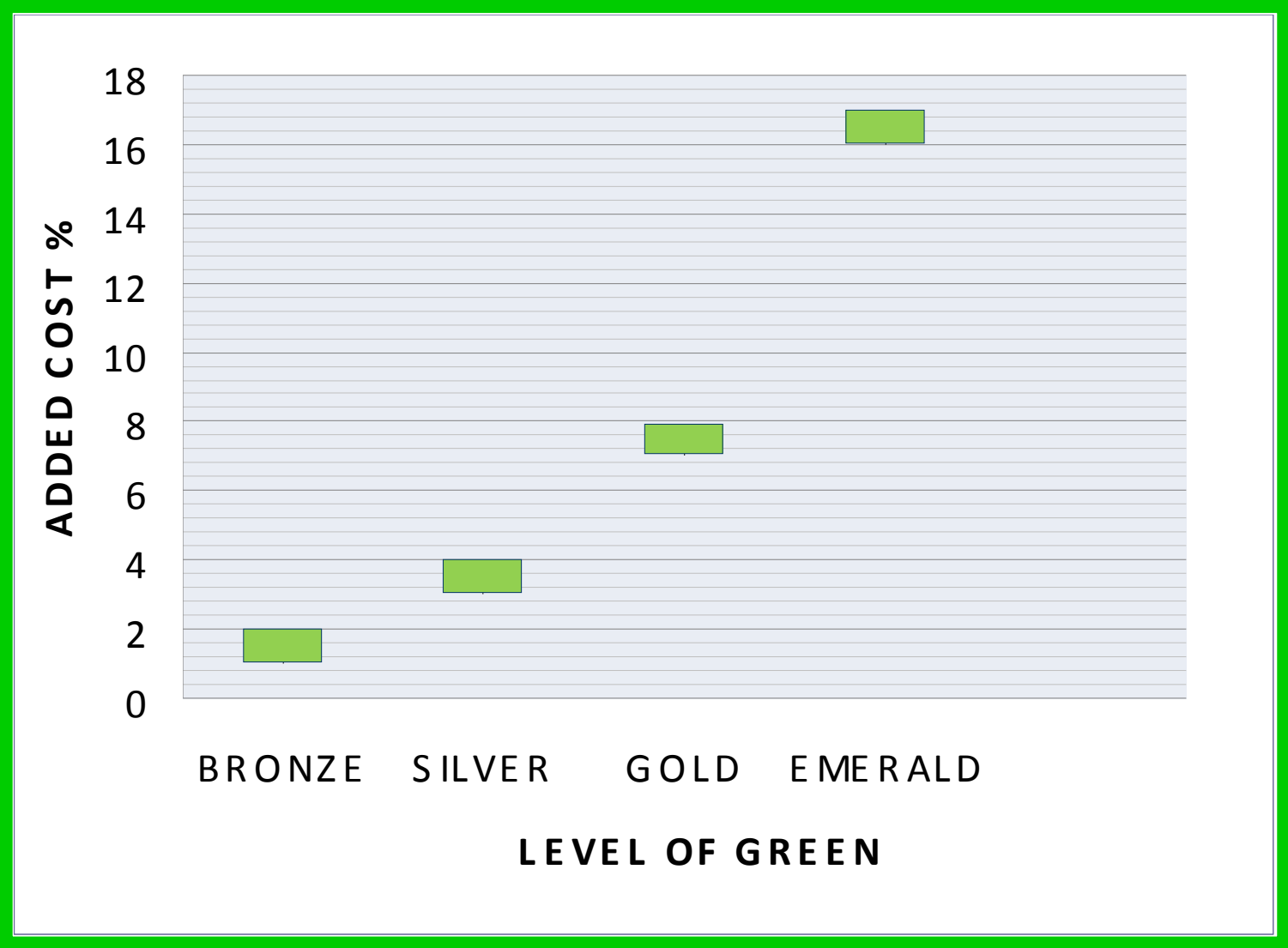
- \* Reach required Bronze score for each chapter *This requirement has been met.*
- \* Reach required Additional Points for this project *This requirement has been met.*
- \* Meet all mandatory items *This requirement has been met.*
- \* For Chapter 7: Energy Efficiency:
  - ~ Claim at least 30 points from Section 702 (Performance Path) or Section 703 (Prescriptive Path) and select a minimum of 2 items from Section 704, **OR**
  - ~ Choose the Alternative Bronze Compliance Path *You have met the Prescriptive Path minimum points requirement.*
  - You have met the minimum 2 required items from Section 704.*

Silver					
Chapter	Required Points	Claimed Points	Additional Claimed Points Above Silver	Point Shortfall	Mandatory Status
Chapter 5: Lot Design, Preparation, & Development	66	90	24		N/A
Chapter 6: Resource Efficiency	79	81	2		Met
Chapter 7: Energy Efficiency	60	56		(4)	Met
Chapter 8: Water Efficiency	26	17		(9)	N/A
Chapter 9: Indoor Environmental Quality	65	70	5		Met
Chapter 10: Operation, Maintenance, & Building Owner Education	10	15	5		Met
<b>Section Totals</b>	306	329	36	(13)	
<b>Additional Points Above Silver</b>	100		36	(64)	
<b>Total Points</b>	406	329		(77)	

**To achieve Silver:**

- \* Reach required Silver score for each chapter *This requirement has not been met yet.*
- \* Reach required Additional Points for this project *This requirement has not been met yet.*
- \* Meet all mandatory items *This requirement has been met.*
- \* For Chapter 7: Energy Efficiency:
  - ~ Claim at least 30 points from Section 702 (Performance Path) or Section 703 (Prescriptive Path) *You have met the Prescriptive Path minimum points requirement.*
  - ~ Select a minimum of 2 items from Section 704 *You have met the minimum 2 required items from Section 704.*

# COST TO GO GREEN





# The Voyager at Space Center

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- Certified Bronze
- NGBS

## Nation's Building News

The Official Online Newspaper of NAHB

### Green Building

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#### Luxury Apartments Near Johnson Space Center Largest Project to Be Certified Green by NAHB

##### Multifamily Industry Pioneers: A First in Green Building

Green Building has swept the nation as the building industry makes strides in environmentally conscious technology and practices to live cleaner and "greener" — and the multifamily sector is proving to be ahead of the game.

The Voyager at the Space Center, in Nassau Bay, Texas, has pioneered the green building agenda and earned its title as a "first" in the certified green world.

Developed by Martin Fain Interests and designed by Steinberg Design Collaborative, LLC, both members of NAHB Multifamily, this 313-unit luxury apartment complex is the largest project to be certified by NAHB's National Green Building Standard, approved by the American National Standards Institute (ANSI).

The development met specific benchmarks in energy, water, and resource efficiency; indoor environmental quality; lot and site development; and operation and maintenance education.

The Voyager, located within walking distance of the Johnson Space Center in Houston, was built on the site of a former government office building, garnering points for the reuse of the parking lot to increase density and for its proximity to employment and retail centers.

"This certification is further evidence of the National Green Building Standard's flexibility in ensuring sustainable construction techniques for all kinds of housing," said NAHB Research Center President Mike Luzier.

This project is the 15th multifamily building to be certified to the standard, according to the NAHB Research Center. There are eight more currently awaiting certification.

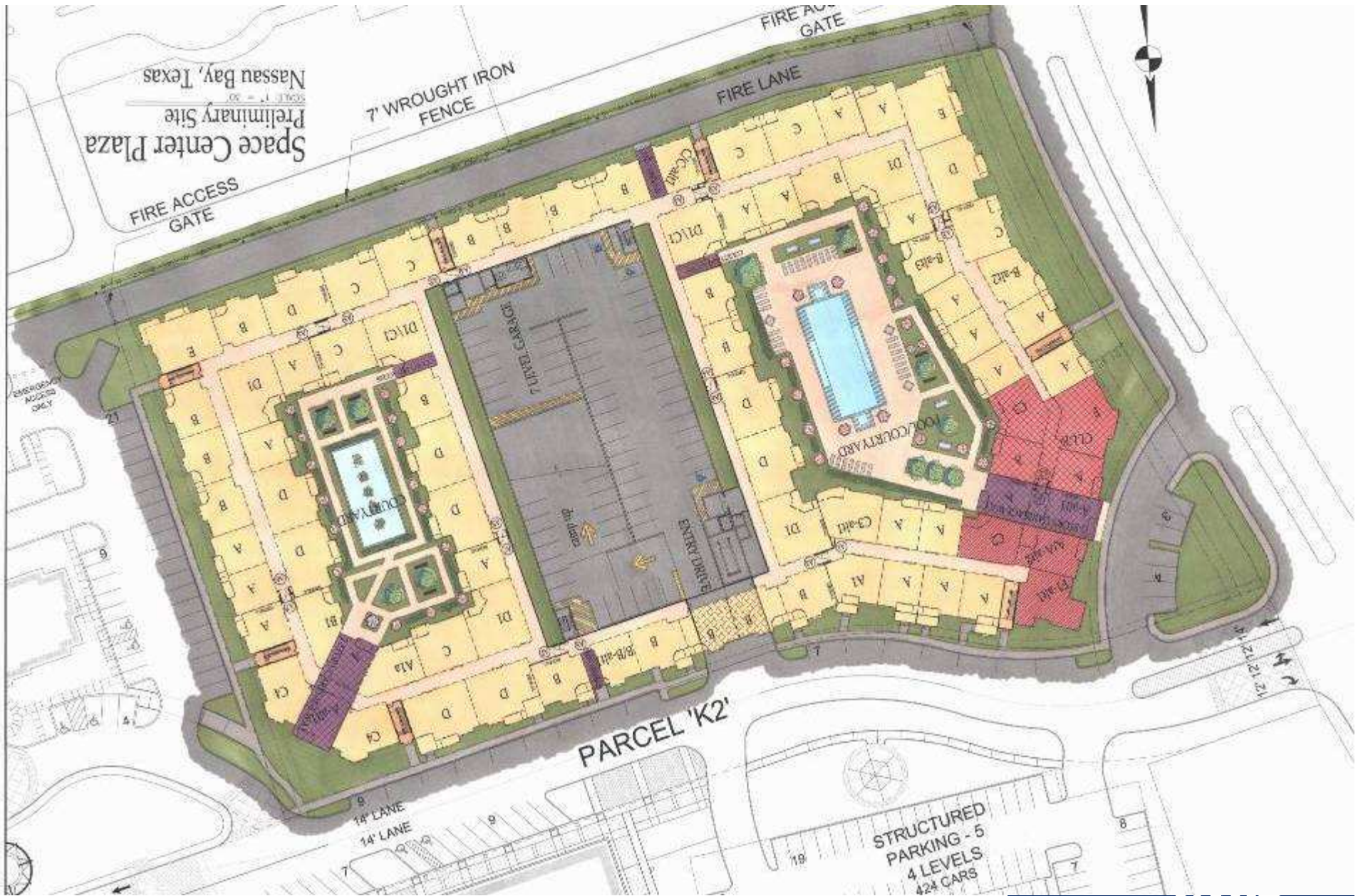
[View the press release here.](#)

[View the article in Nation's Building News here.](#)

For more information, contact Cali Schmidt, or call her at 800-368-5242 x8132.













National Association of Home Builders















# Voyager NGBS Verification Report

## Sign Off After FINAL Inspection

Chapter	Topic	TOTAL Designer Report Claimed	Points Awarded @ ROUGH	Points Awarded @ FINAL	TOTAL Points Awarded	GREEN LEVEL:	BRONZE	SILVER	GOLD	EMERALD	Level Achieved For This Section
5	Lot Design	96	69	27	96	Points needed for:	39	66	93	119	GOLD
6	Resource Efficiency	82	56	23	79	Points needed for:	45	79	113	146	SILVER
7	Energy Efficiency	53	23	30	53	Points needed for:	30	60	100	120	BRONZE
8	Water Efficiency	15	2	13	15	Points needed for:	14	26	41	60	BRONZE
9	Indoor Quality	60	20	40	60	Points needed for:	36	65	100	140	BRONZE
10	Operation	18		18	18	Points needed for:	8	10	11	12	EMERALD

Circle levels achieved in each Chapter & Total.

TOTAL	324	170	151	321	GREEN LEVEL:	BRONZE	SILVER	GOLD	EMERALD	OVERALL Level Achieved
					Points needed for:	222	406	558	697	BRONZE

# The Retreat at The Woodlands Houston, TX

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- Under Construction
- Bronze NGBS

# Retreat NGBS Designers Report



## NGBS Scoring for New Construction ICC 700-2008 National Green Building Standard™

This project has met all the BRONZE requirements

Revised October 13, 2010

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### Bronze

Chapter	Required Points	Claimed Points	Additional Claimed Points Above Bronze	Point Shortfall	Mandatory Status
Chapter 5: Lot Design, Preparation, & Development	39	126	87		N/A
Chapter 6: Resource Efficiency	45	87	42		Met
Chapter 7: Energy Efficiency	30	55	25		Met
Chapter 8: Water Efficiency	14	22	8		N/A
Chapter 9: Indoor Environmental Quality	36	52	16		Met
Education	8	15	7		Met
<b>Section Totals</b>	<b>172</b>	<b>357</b>	<b>185</b>	<b>0</b>	
<b>Additional Points Above Bronze</b>	<b>50</b>		<b>185</b>	<b>0</b>	
<b>Total Points</b>	<b>222</b>	<b>357</b>		<b>0</b>	

# Retreat NGBS Verifier Rough Report

Rough Summary										
Chapter	Topic	Rough Points Claimed	ROUGH Points Awarded	Rough Points Denied	GREEN LEVEL:	BRONZE	SILVER	GOLD	EMERALD	Level Achieved For This Section
5	Lot Design	95	62	33	Points needed for:	39	66	93	119	BRONZE
					Points above/below:	23	-4	-31	-57	
6	Resource Efficiency	69	57	12	Points needed for:	45	79	113	146	BRONZE
					Points above/below:	12	-22	-56	-89	
7	Energy Efficiency	18	10	8	Points needed for:	30	60	100	120	none
					Points above/below:	-20	-50	-90	-110	
8	Water Efficiency	0	0	0	Points needed for:	14	26	41	60	none
					Points above/below:	-14	-26	-41	-60	
9	Indoor Quality	14	13	1	Points needed for:	36	65	100	140	none
					Points above/below:	-23	-52	-87	-127	
10	Operation	0	0	0	Points needed for:	8	10	11	12	none
					Points above/below:	-8	-10	-11	-12	
TOTAL		357	142	54	GREEN LEVEL:	BRONZE	SILVER	GOLD	EMERALD	OVERALL Level Achieved
					Points needed for:	222	406	558	697	none
					Points above/below:	-80	-264	-416	-555	





# Construction Details



# Arcadia's Edge Columbia, SC

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- Under Construction
- Silver NGBS

# Arcadia's Edge NGBS Designers Report

Silver					
Chapter	Required Points	Claimed Points	Additional Claimed Points Above Silver	Point Shortfall	Mandatory Status
Chapter 5: Lot Design, Preparation, & Development	66	133	67		N/A
Chapter 6: Resource Efficiency	79	85	6		Met
Chapter 7: Energy Efficiency	60	72	12		Met
Chapter 8: Water Efficiency	26	30	4		N/A
Chapter 9: Indoor Environmental Quality	65	74	9		Met
Education	10	15	5		Met
<b>Section Totals</b>	<b>306</b>	<b>409</b>	<b>103</b>	<b>0</b>	
<b>Additional Points Above Silver</b>	<b>100</b>		<b>103</b>	<b>0</b>	
<b>Total Points</b>	<b>406</b>	<b>409</b>		<b>0</b>	

#### To achieve Silver:

- Reach required Silver score for each chapter *This requirement has been met.*
- Reach required Additional Points for this project *This requirement has been met.*
- Meet all mandatory items *This requirement has been met.*
- For Chapter 7: Energy Efficiency:
  - ~ Claim at least 30 points from Section 702 (Performance Path)  
or Section 703 (Prescriptive Path) *You have met the Prescriptive Path minimum points requirement.*
  - ~ Select a minimum of 2 items from Section 704 *You have met the minimum 2 required items from Section 704.*



# Construction Details





## Construction Details









# The Verona Houston, TX

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- Certification Process - Bronze
- NGBS



# Verona NGBS Designers Report



NGBS Scoring for New Construction  
ICC 700-2008 National Green Building Standard™

This project has not met all the requirements for  
Bronze, Silver, Gold, or Emerald.

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Bronze					
Chapter	Required Points	Claimed Points	Additional Claimed Points Above Bronze	Point Shortfall	Mandatory Status
Chapter 5: Lot Design, Preparation, & Development	39	52	13		N/A
Chapter 6: Resource Efficiency	45	82	37		Met
Chapter 7: Energy Efficiency	30	36	6		Met
Chapter 8: Water Efficiency	14	15	1		N/A
Chapter 9: Indoor Environmental Quality	36	46	10		Met
Chapter 10: Operation, Maintenance, & Building Owner Education	8	15	7		Met
<b>Section Totals</b>	172	246	74	0	
<b>Additional Points Above Bronze</b>	50		74	0	
<b>Total Points</b>	222	246		0	

#### To achieve Bronze:

- \* Reach required Bronze score for each chapter
- \* Reach required Additional Points for this project
- \* Meet all mandatory items
- \* For Chapter 7: Energy Efficiency:

*This requirement has been met.*

*This requirement has been met.*

*This requirement has been met.*

- ~ Claim at least 30 points from Section 702 (Performance Path) or Section 703 (Prescriptive Path) and select a minimum of 2 items from Section 704, **OR**
- ~ Choose the Alternative Bronze Compliance Path

*You have not met any energy path minimum points requirements yet.*

*You have met the minimum 2 required items from Section 704.*

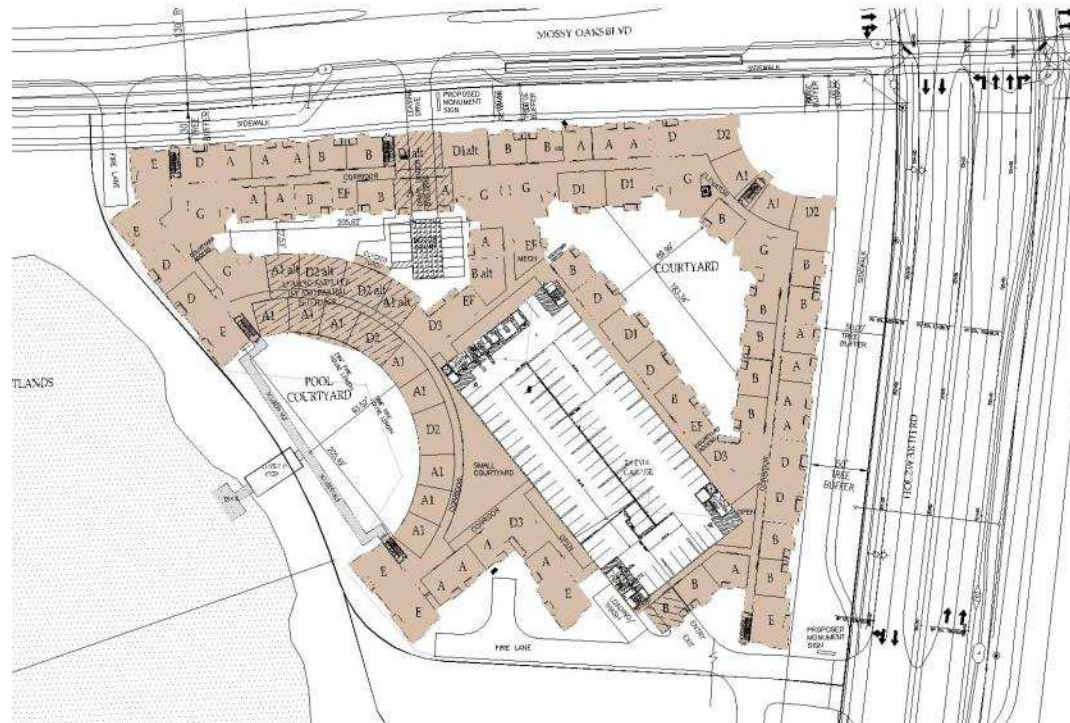








# SPRINGWOODS VILLAGE





# Steinberg

From Concept to Market



- Garden style
- Four story
- Podium
- Mid-rise
- High-rise
- Urban wrap
- Mixed-use
- Green building projects



Steinberg  
Design  
Collaborative, LLP  
ARCHITECTS PLANNERS