

Substantiating Documents for Public Comments Received on 2024 NGBS Draft 1

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PC078 - 705.2 Additional Tropical Zone Practices

705 ALTERNATIVE COMPLIANCE FOR TROPICAL ZONES

705.1 Mandatory practices

705.1.1 High-efficacy lighting. All permanently installed lighting fixtures, excluding appliance lighting fixtures, shall contain only high-efficacy lighting sources.

705.1.2 Attics. Attics above the insulation are vented and attics below the insulation are unvented.

705.1.3 Roofs. Roof surfaces have a slope of not less than 1/4 unit vertical in 12 units horizontal (2.0-percent slope). The roof does not have water accumulation areas.

705.1.4 Operable fenestration

705.1.4.1 Ventilation area. Operable fenestration provides an operable area of not less than 10 percent of the floor area of the living space.

705.1.4.2 Bedroom exterior walls. Bedrooms with exterior walls facing two or more directions have operable fenestration on exterior walls facing not less than two directions.

705.1.4.3 Glazing in conditioned spaces. Glazing in conditioned spaces has a solar heat gain coefficient (SHGC), as described in Table 705.2.2, or has an overhang with a projection factor equal to or greater than 0.30 and a solar heat gain coefficient of no greater than 0.30.

Exception: jalousie windows.

705.1.5 Interior doors. Bedroom doors are capable of being secured in an open position.

705.2 Additional Tropical Zone practices

705.2.1 Water Heater. A renewable energy source provides annual service water heating greater than or equal to the percentages in Table 705.2.1.

Table 705.2.1
Renewable Energy for Service Water Heater

$\geq 80\%$	$\geq 90\%$
Silver	Gold

705.2.2 Glazing. Glazing in conditioned spaces has an Solar Heat Gain Coefficient (SHGC) according to Table 705.2.2 below:

Table 705.2.2
Solar Heat Gain Coefficient (SHGC)

0.26 – 0.30	≤ 0.25
Silver	Gold

705.2.3 Exterior Walls. Exterior walls comply with not less than one of the following:

(1) Silver — one practice.

(2) Gold — two practices:

(a) Walls have insulation with an R value of R-13 or greater.

(b) Walls have a solar reflectance of 0.64.

705.2.4 Roof. The exterior roof surface complies with not less than one of the following:

- (1) Silver — one practice.
- (2) Gold — two or more practices:
 - (a) Minimum initial solar reflectance of 0.75 and emittance of 0.75.
 - (b) Minimum initial solar reflectance index of 75.
 - (c) Roof or ceiling has insulation with an R-Value of R-13 or greater.
 - (d) Includes a radiant barrier.

705.2.5 Ceiling fans.

- (1) A ceiling fan rough-in is provided for bedrooms and the largest living space that is not used as a bedroom..... **Silver**
- (2) A ceiling fan is provided for bedrooms and the largest living space that is not used as a bedroom..... **Gold**

705.2.6 Air conditioning. All installed air conditioners have a minimum of 18 SEER2. **Gold**

705.2.7 Renewable energy system. For each dwelling unit, the building or lot is served by a minimum of 2kW renewable energy system and a minimum of 6kWh of energy storage..... **Gold**

705.2.8 Electric vehicle charging.

- (1) Wiring sufficient for a A Level 2 (208/240V 32-80 amp) electric vehicle charging station is installed on the building site..... **Silver**
- (2) A Level 2 (208/240V 32-80 amp) electric vehicle charging station is installed on the building site. **Gold**

705.2 Additional Tropical Zone practices – SILVER

705.2.1 Water Heater. A renewable energy source provides no less than 80% of annual service water heating needs.

705.2.2 Glazing. Glazing in conditioned space has a Solar Heat Gain Coefficient (SHGC) between 0.26 and 0.30.

705.2.3 Exterior Walls. Exterior walls comply with one of the following:

- (1) Wall insulation has an R-value of R-13 or greater.
- (2) Walls have a solar reflectance of 0.64.

705.2.4 Roof. The exterior roof surface complies with one of the following:

- (1) Minimum initial solar reflectance and emittance of 0.75.
- (2) Minimum initial solar reflectance of 75.
- (3) Roof or ceiling insulation with R-Value of R-13 or greater.
- (4) Radiant barrier installed.

705.2.5 Ceiling Fans. A ceiling fan rough-in is provided for bedrooms and the largest living space that is not used as a bedroom.

705.2.6 Electric Vehicle Charging. Wiring sufficient for a Level 2 (208/240V 32-80 amp) electric vehicle charging station is installed on the building site.

705.3 Additional Tropical Zone practices – GOLD

705.3.1 Water Heater. A renewable energy source provides no less than 90% of annual service water heating needs.

705.3.2 Glazing. Glazing in conditioned space has a Solar Heat Gain Coefficient (SHGC) no less than 0.25.

705.3.3 Exterior Walls. Exterior walls comply with the following:

- (1) Wall insulation has an R-value of R-13 or greater.
- (2) Walls have a solar reflectance of 0.64.

705.3.4 Roof. The exterior roof surface complies with two or more of the following:

- (1) Minimum initial solar reflectance and emittance of 0.75.
- (2) Minimum initial solar reflectance of 75.
- (3) Roof or ceiling insulation with R-Value of R-13 or greater.
- (4) Radiant barrier installed.

705.3.5 Ceiling Fans. A ceiling fan is provided for bedrooms and the largest living space that is not used as a bedroom.

705.3.6 Air Conditioning. All installed air conditioners have a rating of no less than 18 SEER2.

705.2.7 Renewable Energy System. For each dwelling unit, the building or lot is served by a minimum of 2kW renewable energy system and a minimum of 6kWh of energy storage.

705.2.8 Electric Vehicle Charging. A Level 2 (208/240V 31-80 amp) electric vehicle charging station is installed on the building site.

PC083 - 707.4 Pumps



ENERGY STAR CERTIFIED
Pool Pumps

Pentair - WhisperFlo VST : 011533

Specifications

ENERGY STAR Unique ID:	2393189
ENERGY STAR Partner:	Pentair Management Company
Brand Name:	Pentair
Model Name:	WhisperFlo VST
Model Number:	011533
Product Type:	In-Ground (Self-Priming) Pool Filter Pump
Motor Design:	Variable-speed
Hydraulic Horsepower (HHP):	1.64
Rated Horsepower (HP):	2.6
Weighted Energy Factor (WEF) (kgal/kWh):	8.4
Product Type:	Self-Priming (Inground)
Connected Capable:	No
Freeze Protection:	No
Markets:	United States, Canada
ENERGY STAR Certified:	Yes

Additional Model Information

UPC Codes	788379888800
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Captured On:
09/19/2023

PC095 - SECTION 8 - Overall

Chapter 8 – Prescriptive and Performance Path Point Analysis

Under Chapter 8 of 2024 NGBS, a building has two pathways for achieving certification: Prescriptive Path or Performance Path (based on the Water Rating Index methodology in Appendix D). The HI team performed an in-depth analysis to identify whether the same home scored under both paths would earn the same certification level. Our conclusions:

- **Outdoor water use per unit or per occupant** –The WRI calculates outdoor water demand of irrigated areas and pools, spas, and fountains. The outdoor water total for a Single-family home and a Multifamily building having equal landscape area is equal. Outdoor water demand is not adjusted based on occupancy. We ask the Task Group to consider dividing outdoor water use by number of units or number of occupants. Alternatively, a “size adjustment factor” could be applied based on the building type.
- **Penalty based on location** –The reference homes located in a dry climate zone were able to achieve a low WRI score more easily than similar homes in the wet climate zone. This difference is based on how baseline outdoor water was calculated: The outdoor baseline calculation depends on the evapotranspiration values and the required watering months of the location. If the watering months are more (between 1 to 12), the outdoor baseline will be higher. For example, a single-family reference home has an outdoor baseline of 382,969 gal in a dry climate like Albuquerque NM (having six watering months: Mar to Aug) but the exact same reference home in high rainfall climate like Doral FL (having all twelve watering months) has an outdoor baseline of 518,885 gal. We ask the task group to recheck these watering month requirements for different locations.
- **Prescriptive path points for indoor water** – It is relatively easy for low efficiency reference homes to achieve a silver level based solely on indoor water use practices within the prescriptive path. On the contrary, the same reference homes modeled using WRI achieve a bronze level or do not achieve any certification level (WRI score > 70). We recommend that the Prescriptive Path point allocations be revisited to raise the stringency, making it more comparable to the Performance Path.
- **No landscaping vs no irrigation** - If a building does not have any landscaping or irrigation, it is not eligible to receive points under 802.6 Irrigation Systems. On the other hand, a building with landscaping but no irrigation systems installed (hand watering or similar) acquires **15** points under 802.6.4(2) even though it realistically consumes much

more water than the building with no landscaping. Should there be an additional practice that under 802.6 those awards points for no landscaping (and no irrigation)?

- **Irrigation efficiency table** – After modeling close to fifty reference homes using the WRI methodology, it seems that the Hand Irrigation method ($\eta=1$) always receives a higher WRI score compared to other methods irrespective of lot size and location. Tied with Hand Irrigation are Flood and Direct Injection methods having the same efficiencies ($\eta=1$). We ask the Task Group to revisit the values in Table D101.9.4(3) Irrigation Efficiency and update based on available research on irrigation efficiency.

PC140 - 13.103.2 Building thermal
envelope insulation and fenestration

A093	ID 8252	13.105.1 Building thermal envelope insulation	Final Formal Action: Accept as Modified
Submitter:	Carl Seville, Josh Hanson, & Thomas Culp, SK Collaborative, US-EcoLogic, & Birch Point Consulting		
Comment:	<p>13.105.1 Building thermal envelope insulation and fenestration. The non-residential portion of the building must comply shall be in accordance with one of the following:</p> <p>(1) The insulation requirements of ICC IECC Sections C402.1 through C402.3C402.4 or R402.1 through R402.3 including table R402.4.1.1, as applicable, and § 13.105.1.1. A UA tradeoff shall be allowed for § 13.105.1 and § 13.105.2 is equal to or less than the ICC IECC UA.</p> <p>(2) The entire building thermal envelope, including both residential and non-residential, meet the total ICC IECC UA per section C402.1.5 or R402.1.5, as applicable.</p> <p>(3) The entire building meets the ICC IECC as demonstrated with a whole building energy model per ICC IECC section C407.</p> <p>(4) The entire building complies with ASHRAE 90.1 Section 4.2.1.1.c Appendix G.</p> <p>Maximum UA. For ICC IECC residential, the total building UA is less than or equal to the total maximum UA as computed by 2015 ICC IECC Section R02.1.5. For ICC IECC commercial, the total UA is less than or equal to the sum of the UA for 2015 ICC IECC Tables C402.1.4 and C402.4, including the U-factor times the area and C-factor or F-factor times the perimeter. The total UA proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation</p>		
Reason:	If the entire building meets the energy code, there is no reason that attached commercial space should not comply if the envelope of that area was not compliant with the prescriptive code. Included more direct language for alignment with 13.105.2 and 13.105.12 (prescriptive, UA trade off and modeling as applicable options)		
CC Action:	Accept as Modified		
CC Modification:	<p>13.105.1 Building thermal envelope insulation and fenestration. <u>Comply with one of the following:</u></p> <p>(1) The insulation requirements of <u>IECC Sections</u> C402.1 through C402.3C402.4 or R402.1 through R402.3 including table R402.4.1.1, as applicable, and § 13.105.1.1. A UA tradeoff shall be allowed for § 13.105.1 and § 13.105.2 is equal to or less than the ICC IECC UA.</p> <p>(2) The entire building thermal envelope, including both residential and non-residential, <u>comply with total IECC Section</u> C402.1.5 or R402.1.5, as applicable.</p> <p>(3) The entire building <u>complies with the IECC</u> as demonstrated with a whole building energy model <u>in accordance with IECC Section</u> C407.</p> <p>(4) The entire building complies with ASHRAE 90.1 Section 4.2.1.1.c Appendix G.</p>		
CC Reason:	Clarify the intent of the standard.		

Maximum UA. For ICC IECC residential, the total building UA is less than or equal to the total maximum UA as computed by 2015~~2021~~ ICC IECC Section R402.1.5. For ICC IECC commercial, the total UA is less than or equal to the sum of the UA for 2015~~2021~~ ICC IECC Tables C402.1.4 and C402.4, including the U-factor times the area and C-factor or F-factor times the perimeter. The total UA proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation or the entire building envelope including non-commercial areas ~~meets~~complies with the total IECC UA or the entire building meetscomplies with the IECC as demonstrated with whole building energy model.

PC150 - APPENDIX B: EXAMPLES OF
THIRD-PARTY PROGRAMS FOR INDOOR
ENVIRONMENTAL QUALITY

APPENDIX B:
 EXAMPLES OF THIRD-PARTY PROGRAMS AND ACCREDITATION FOR
 INDOOR ENVIRONMENTAL QUALITY

B100 SCOPE AND APPLICABILITY

B101.1 Applicability of Appendix B. Appendix B is not part of this Standard.

B101.2 Scope. Appendix B provides examples of third-party programs for indoor environmental quality and accreditation that can be used to demonstrate compliance with the applicable provisions of this Standard.

B200 CONFORMANCE

TABLE B200(1) Examples of Third-party Certification Programs <u>and Accreditation</u>	
Related Section of Standard	Examples of Third-party Certification Programs Compliant with the Corresponding Section
<u>403.1 (3) Natural resources</u>	<u>USDA Natural Resource Conservation Service (NRCS) Conservation programs</u>
<u>404.4 (4) Wildlife habitat</u>	<u>Wildlife Conservation Land Program (WCLP)</u> <u>USDA Wildlife Habitat Management Programs</u>
<u>503.6 (2)/11.503.6 (2) Wildlife habitat</u>	<u>Garden for Wildlife, National Wildlife Federation (NWR) Wild Acres, MD Department of Natural Resources</u>
<u>602.1.7.2/11.602.1.7.2 Moisture control measures</u>	<u>Carpet and Rug Institute’s (CRI) Green Label Plus Indoor Air Quality Program UL GREENGUARD Gold Resilient Floor Covering Institute’s FloorScore Indoor Air Certification Program</u>
<u>602.1.15/11.602.1.15 Kitchen and vanity cabinets</u>	<u>Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)</u>
<u>602.2 (3)/11.602.2 (3) Roof surfaces</u>	<u>Cool Roof Rating Council (CRRC)</u>
<u>606.1/11.606.1 Biobased products (g/h)</u>	<u>Forest Stewardship Council (FSC)</u> <u>United States Department of Agriculture (USDA)</u>

<u>606.2/11.606.2 Wood-based products</u>	<u>Forest Stewardship Council (FSC)</u>
<u>612.2/11.612.2 Sustainable products</u>	<u>Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program UL GREENGUARD Gold Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program</u>
<u>802.6.2/11.802.6.2 Irrigation systems</u>	<u>UL SPLASH Field Sample Sprinkler Testing</u>
901.5 Cabinets	Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)
901.6 Carpets	Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program
901.7 Hard-surface flooring	UL GREENGUARD Gold Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program, <u>Carpet and Rug Institute's (CRI) Label Plus Indoor Air Quality Program</u>
901.8 Wall coverings	UL GREENGUARD Gold Scientific Certification Systems (SCS) Indoor Advantage Gold Program
901.9 Architectural coatings	UL GREENGUARD Gold Scientific Certification Systems (SCS) Indoor Advantage Gold Program Green Seal-11 Standard for Paints and Coatings UL 2768
901.10 Adhesives and sealants	UL GREENGUARD Scientific Certifications Systems (SCS) Indoor Advantage Gold Program Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program Green Seal-36 Standard for Adhesives for Commercial Use
901.11 Insulation	UL GREENGUARD Gold Scientific Certifications Systems (SCS) Indoor Advantage Gold Program
901.12 Furniture and Furnishing	UL GREENGUARD Gold Scientific Certifications Systems (SCS) Indoor Advantage Gold Program BIFMA level certification where 7.6.1 and 7.6.2 are proven to be achieved
TABLE B200(2) Contact Information for the Example Third-party Certification Programs	
Third-party Certification Program	Contact Information for the Program Administrator
Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)	<i>Kitchen Cabinet Manufacturers Association 1899 Preston White Drive Reston, VA 20191 www.kcma.org (703) 264-1690</i>
Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program	<i>Carpet and Rug Institute 730 College Drive</i>

	<p>Dalton, Georgia 30720 United States of America http://www.carpet-rug.org (706) 278-3176</p>
UL GREENGUARD Gold	<p>Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com (877) 854-3577</p>
Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program	<p>Resilient Floor Covering Institute 115 Broad Street, Suite 201 LaGrange, Georgia 30240 http://www.rfci.com</p>
Scientific Certification Systems (SCS) Indoor Advantage Gold Program	<p>Scientific Certification Systems 2000 Powell Street, Suite 600 Emeryville, California 94608 http://www.scscertified.com (510) 452-8000</p>
Green Seal-11 Standard for Paints and Coatings	<p>Green Seal 1001 Connecticut Avenue, NW, Suite 827 Washington, DC 20036-5525 http://www.greenseal.org/ (202) 872-6400</p>
UL 2768	<p>Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com (877) 854-3577</p>
<u>UL SPLASH Field Sample Sprinkler Testing</u>	<p><u>Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com (877) 854-3577</u></p>
<u>USDA Natural Resource Conservation Service (NRCS) Conservation programs</u>	<p><u>United States Department of Agriculture 1400 Independence Ave SW, Washington, DC 20250 https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/ (202) 720-7246</u></p>
<u>USDA Wildlife Habitat Management Programs</u>	<p><u>United States Department of Agriculture 1400 Independence Ave SW, Washington, DC 20250 https://www.usda.gov/topics/conservation/wildlife (202) 720-7246</u></p>
<u>Garden for Wildlife, National Wildlife Federation (NWR)</u>	<p><u>National Wildlife Federation Mid-Atlantic Regional Center 20 Ridgely Avenue, Suite 203 Annapolis, MD 21401 http://www.nwf.org/Mid-Atlantic/MidAtlantic@nwf.org (443)-759-3400</u></p>

<u>Cool Roof Rating Council (CRR)</u>	<u>Cool Roof Rating Council</u> <u>2435 N. Lombard St.</u> <u>Portland, OR 97217</u> https://coolroofs.org/programs/roof-rating-program <u>(866) 465-2523</u>
<u>Forest Stewardship Council (FSC)</u>	<u>Forest Stewardship Council</u> <u>708 First Street North, Suite 235</u> <u>Minneapolis, MN 55401</u> https://us.fsc.org/en-us/certification <u>(612) 353 4511</u>