

# 58868 12-14-16  
 55/65

OMB No. 1660-0008  
 Expiration Date: November 30, 2018

# ELEVATION CERTIFICATE

Important: Follow the instructions on pages 1-9.

OK  
 12-16-16

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A - PROPERTY INFORMATION				FOR INSURANCE COMPANY USE	
A1. Building Owner's Name Richard Earl Skipper Jr				Policy Number:	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 1084 Waccamaw Drive				Company NAIC Number:	
City Conway		State South Carolina		ZIP Code 29526	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) TMS# 137-17-01-036					
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) residential					
A5. Latitude/Longitude: Lat. N33° 48' 36.34" Long. W79° 02' 58.97" Horizontal Datum: <input type="checkbox"/> NAD 1927 <input checked="" type="checkbox"/> NAD 1983					
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.					
A7. Building Diagram Number 6					
A8. For a building with a crawlspace or enclosure(s):					
a) Square footage of crawlspace or enclosure(s) 824 sq ft					
b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade 4					
c) Total net area of flood openings in A8.b 940 sq in					
d) Engineered flood openings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
A9. For a building with an attached garage:					
a) Square footage of attached garage 0 sq ft					
b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade 0					
c) Total net area of flood openings in A9.b 0 sq in					
d) Engineered flood openings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number Horry County 450104			B2. County Name Horry County		B3. State South Carolina
B4. Map/Panel Number 45051C0516	B5. Suffix H	B6. FIRM Index Date 09/17/2003	B7. FIRM Panel Effective/ Revised Date 08/23/1999	B8. Flood Zone(s) AE & Floodway	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) 10
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input type="checkbox"/> FIS Profile <input checked="" type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other/Source: _____					
B11. Indicate elevation datum used for BFE in Item B9: <input checked="" type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other/Source: _____					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Designation Date: _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA					



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City Conway	State South Carolina	ZIP Code 29526	Company NAIC Number

## SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on:  Construction Drawings\*  Building Under Construction\*  **Finished Construction**

\*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: GPS on Real Time Network Vertical Datum: NAVD88

Indicate elevation datum used for the elevations in items a) through h) below.

NGVD 1929  NAVD 1988  Other/Source: \_\_\_\_\_

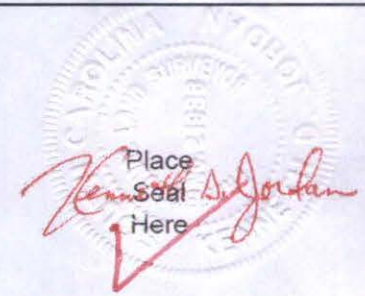
Datum used for building elevations must be the same as that used for the BFE.

		Check the measurement used.
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	8. 27	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
b) Top of the next higher floor	21. 19	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
c) Bottom of the lowest horizontal structural member (V Zones only)	N/A	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
d) Attached garage (top of slab)	N/A	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	20. 03	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
f) Lowest adjacent (finished) grade next to building (LAG)	7. 49	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
g) Highest adjacent (finished) grade next to building (HAG)	7. 64	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	7. 94	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters

## SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

Were latitude and longitude in Section A provided by a licensed land surveyor?  Yes  No  Check here if attachments.

Certifier's Name Kenneth D Jordan	License Number 21936	 <p>Place Seal Here</p>
Title President		
Company Name K & R Land Surveyors		
Address 312 Laurel Street		
City Conway	State South Carolina	
Signature <i>Kenneth D. Jordan</i>	Date 12/08/2016	Telephone (843) 248-4439

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments (including type of equipment and location, per C2(e), if applicable)  
Elevations were determined using Real-Time Network GPS and converted to NGVD29 Datum using NGS Vertcon Software

The lowest piece of machinery is the A/C unit.



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## SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
- a) Top of bottom floor (including basement, crawlspace, or enclosure) is \_\_\_\_\_ . \_\_\_\_\_  feet  meters  above or  below the HAG.
- b) Top of bottom floor (including basement, crawlspace, or enclosure) is \_\_\_\_\_ . \_\_\_\_\_  feet  meters  above or  below the LAG.
- E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is \_\_\_\_\_ . \_\_\_\_\_  feet  meters  above or  below the HAG.
- E3. Attached garage (top of slab) is \_\_\_\_\_ . \_\_\_\_\_  feet  meters  above or  below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is \_\_\_\_\_ . \_\_\_\_\_  feet  meters  above or  below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?  Yes  No  Unknown. The local official must certify this information in Section G.

## SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner or Owner's Authorized Representative's Name

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ ZIP Code \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_ Telephone \_\_\_\_\_

Comments

Check here if attachments.



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<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
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## SECTION G – COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.

- G1.  The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)
- G2.  A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.
- G3.  The following information (Items G4–G10) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate of Compliance/Occupancy Issued
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G7. This permit has been issued for:  New Construction  Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building: \_\_\_\_\_  feet  meters Datum \_\_\_\_\_

G9. BFE or (in Zone AO) depth of flooding at the building site: \_\_\_\_\_  feet  meters Datum \_\_\_\_\_

G10. Community's design flood elevation: \_\_\_\_\_  feet  meters Datum \_\_\_\_\_

Local Official's Name \_\_\_\_\_ Title \_\_\_\_\_

Community Name \_\_\_\_\_ Telephone \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Comments (including type of equipment and location, per C2(e), if applicable)

Check here if attachments.



# BUILDING PHOTOGRAPHS

## ELEVATION CERTIFICATE

See Instructions for Item A6.

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If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.



Photo One

Photo One Caption

Front 12/08/2016



Photo Two

Photo Two Caption

Rear 12/08/2016



**ELEVATION CERTIFICATE**

**BUILDING PHOTOGRAPHS**

Continuation Page

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If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8.



Photo One

Photo One Caption

Right 12/08/2016



Photo Two

Photo Two Caption

Left 12/08/2016



# Certification of Engineered Flood Openings

In accordance with NFIP, FEMA TB 1-08, and ASCE/SEI 24-05

I hereby certify that the Crawl Space Door Systems flood vents 816CS, 1220CS, 1232CS, 1616CS, 1624CS, 1632CS, 2032CS, 2424CS, and 2436CS are designed in accordance with the requirements of the NFIP "Flood Insurance Manual" (2011) to provide automatic equalization of hydrostatic flood forces by allowing for the entry and exit of floodwaters, when properly installed and sized as set forth below. This certification follows the design requirements and specifications established in FEMA Technical Bulletin 1-08, "Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas", and the ASCE Standard for "Flood Resistant Design and Construction" (ASCE/SEI 24-05).

## Design Characteristics

Section 2.6.2.2 of ASCE 24 provides an equation to determine the required net area of engineered openings ( $A_o$ ) for a given enclosed area ( $A_e$ ). This equation is based on the hydraulic formula for the flow rate across sharp edged orifices. I have utilized this equation to calculate 1) the respected flow rate through the individual openings between louvers; 2) the flow rate through the main frame opening in case the louver is blown out during a flood event; and 3) the flow rate of water flowing through louver blades following hydraulic short tube theory. The ultimate maximum total enclosed area ( $A_e$ ) that can be serviced by a single vent has then been determined by utilizing the lowest flow rate of the three assessed scenarios for each vent and is listed in Table 1.

These values are based on the following assumptions:

- In absence of reliable data, the rates of rise and fall have been assumed with 5 feet/hour;
- The (maximum) difference between the exterior and interior floodwater levels has been assumed with 1 foot during base flood conditions;
- A factor of safety of 5 has been assumed, which is consistent with design practices related to protection of life and property;
- The net area of openings ( $A_o$ ) as provided by the manufacturer.

Keep in file  
1/10/12

*)	Model	H x W [in]	$A_o$ [in <sup>2</sup> ]	$A_e$ [ft <sup>2</sup> ]
<input type="checkbox"/>	816CS	8 x 16	105	205
<input type="checkbox"/>	1220CS	12 x 20	235	500
<input type="checkbox"/>	1232CS	12 x 32	305	645
<input type="checkbox"/>	1616CS	16 x 16	180	395
<input type="checkbox"/>	1624CS	16 x 24	310	670
<input type="checkbox"/>	1632CS	16 x 32	405	835
<input type="checkbox"/>	2032CS	20 x 32	630	1240
<input type="checkbox"/>	2424CS	24 x 24	570	1230
<input type="checkbox"/>	2436CS	24 x 36	850	1765

## Installation Requirements and Limitations

This certification will be voided if the following installation requirements and limitations are not enforced:

- There shall be a minimum of two openings on different sides of each enclosed area;
- The bottom of each required opening shall be no more than 1ft above the adjacent ground level;
- No temporary (e.g. during cold weather) or permanent solid cover may be placed into or over the flood vent that would block the automatic entry or exit of floodwaters at any time;
- Where analysis indicates rates of rise and fall greater than 5 ft/hr, the total enclosed area as given in Table 1 shall be reduced accordingly to account for the higher rates of rise and fall.

Table 1 Maximal total enclosed area ( $A_e$ ) that can be served by each individual model based on the given net area of engineered openings ( $A_o$ )

## Identification of the Building and Installed Flood Vents

The flood vent models marked in Table 1\*) are being installed at the following building:

Building Address

## Certifying Design Professional

Name Frederick Allen House  
 Title President-House Engineering P.C.  
 Address P O Box 466, Kitty Hawk, NC 27949  
 Type of License Professional Engineer  
 License # 26841  
 Issuing State South Carolina

Signature

*Frederick Allen House 7/23/12*

