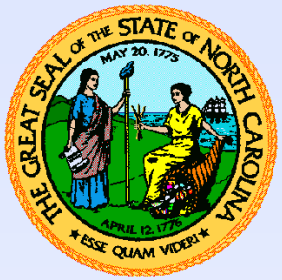





# North Carolina Society of Surveyors

# Elevation Certificate Training

## March 18, 2017

**Dan Brubaker, PE, CFM**





**North Carolina Emergency Management**

# What is the purpose of the Elevation Certificate?

- Verify Regulatory compliance
- Flood Insurance Policy Rating
- Support of applications for map revisions & amendments
- Required for CRS program

**NOTE:**

Data collected on this form is for the construction & utility service to a single STRUCTURE only.

Not the lot or other improvements.

# Who must have an Elevation Certificate?

- Anyone who has applied for insurance on a building that is located in a Special Flood Hazard Area (SFHA) ;
- and the construction or substantial improvement of the building started after December 31, 1974 or on or after the date of the initial Flood Insurance Rate Map (FIRM), whichever is later.

# Pre-FIRM vs. Post-FIRM

On or before 12/31/74 or before the original FIRM date

After 12/31/74 and on or after the original FIRM date

# Federal Emergency Management Agency
# Community Status Book Report
## NORTH CAROLINA
### Communities Participating in the National Flood Program

| CID | Community Name | County | Init FHBM Identified | Init FIRM Identified | Curr Eff Map Date | Reg-Emer Date | Tribal |
|---|---|---|---|---|---|---|---|
| 370165# | ABERDEEN, TOWN OF | MOORE COUNTY | 11/30/73 | 05/15/86 | 01/02/08 | 05/15/86 | No |
| 370131# | AHOSKIE,TOWN OF | HERTFORD COUNTY | 02/22/74 | 05/01/87 | 08/03/09(M) | 05/01/87 | No |
| 370001# | ALAMANCE COUNTY* | ALAMANCE COUNTY | 01/03/75 | 12/01/81 | 01/02/08 | 12/01/81 | No |
| 370457# | ALAMANCE, VILLAGE OF | ALAMANCE COUNTY | 01/03/75 | 08/15/90 | 01/02/08 | 12/17/87 | No |
| 370223# | ALBEMARLE, CITY OF | STANLY COUNTY | 12/21/73 | 12/01/81 | 06/16/09 | 12/01/81 | No |
| 370398# | ALEXANDER COUNTY* | ALEXANDER COUNTY | 06/09/78 | 02/01/91 | 07/07/09 | 02/01/91 | No |
| 370004# | ALLEGHANY COUNTY* | ALLEGHANY COUNTY | 07/01/77 | 02/01/04 | 11/04/09 | 02/01/04 | No |
| 370404# | ALLIANCE, TOWN OF | PAMLICO COUNTY | 07/14/78 | 08/05/85 | 07/02/04 | 08/05/85 | No |
| 370060# | ANDREWS, TOWN OF | CHEROKEE COUNTY | 03/08/74 | 02/01/85 | 04/19/10 | 02/01/85 | No |
| 370522# | ANGIER, TOWN OF | HARNETT COUNTY | | 04/16/90 | 07/17/07 | 02/03/00 | No |
| 370284# | ANSON COUNTY * | ANSON COUNTY | 07/15/77 | 06/18/90 | 10/16/08 | 06/18/90 | No |
| 370467# | APEX, TOWN OF | WAKE COUNTY | | 03/03/92 | 04/16/07 | 03/20/92 | No |
| 370273# | ARCHDALE, CITY OF | GUILFORD COUNTY/RANDOLPH COUNTY | 03/01/74 | 07/16/81 | 03/16/09 | 07/16/81 | No |
| 370462# | ARCHER LODGE, TOWN OF | JOHNSTON COUNTY | | 12/02/05 | 12/02/05 | 05/06/14 | No |
| 370007# | ASHE COUNTY * | ASHE COUNTY | 01/03/75 | 08/16/88 | 12/03/09 | 08/16/88 | No |

http://www.fema.gov/cis/NC.pdf

# Determine Policy Premiums

## 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: _____ Vertical Datum: _____

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) | _____ . _____ | ☐ feet | ☐ meters |
| b) Top of the next higher floor | _____ . _____ | ☐ feet | ☐ meters |
| c) Bottom of the lowest horizontal structural member (V Zones only) | _____ . _____ | ☐ feet | ☐ meters |
| d) Attached garage (top of slab) | _____ . _____ | ☐ feet | ☐ meters |
| e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | _____ . _____ | ☐ feet | ☐ meters |
| f) Lowest adjacent (finished) grade next to building (LAG) | _____ . _____ | ☐ feet | ☐ meters |
| g) Highest adjacent (finished) grade next to building (HAG) | _____ . _____ | ☐ feet | ☐ meters |
| h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | _____ . _____ | ☐ feet | ☐ meters |

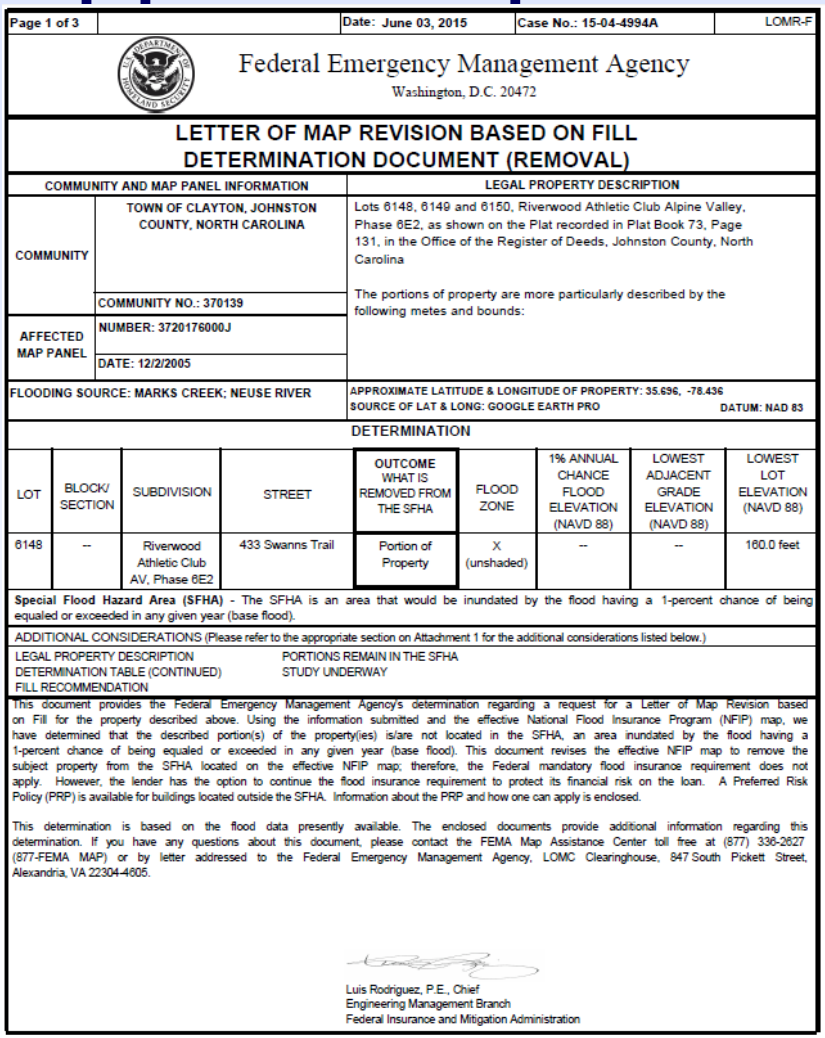
| Elevation of Lowest Floor Above or Below BFE[1] | One Floor, No Basement/Encl | | More than One Floor, No Basement/Encl | | More than One Floor, With Basement/Encl | | Manufactured (Mobile) Home[2] | |
|---|---|---|---|---|---|---|---|---|
| | 1-4 Family | Other Residential & Non-Residential | 1-4 Family | Other Residential & Non-Residential | 1-4 Family | Other Residential & Non-Residential | Single Family | Non-Residential |
| +4 | .24 / .08 | .20 / .08 | .24 / .08 | .20 / .08 | .24/ .08 | .20 / .08 | .24 / .08 | .20 / .08 |
| +3 | .24 / .08 | .20 / .08 | .24 / .08 | .20 / .08 | .24 / .08 | .20 / .08 | .25 / .08 | .22 / .08 |
| +2 | .32 / .08 | .26 / .08 | .24 / .08 | .20 / .08 | .24 / .08 | .20 / .08 | .31 / .08 | .25 / .08 |
| +1 | .59 / .08 | .45 / .10 | .38 / .08 | .28 / .08 | .29 / .08 | .22 / .08 | .73 / .09 | .72 / .08 |
| 0 | 1.08 / .08 | .97 / .20 | .77 / .08 | .59 / .16 | .56 / .08 | .50 / .16 | 1.67 / .09 | 1.62 / .08 |
| -1[3] | 2.70 / 1.00 | 3.85 / 1.36 | 2.40 / .90 | 3.00 / .69 | 1.36 / .52 | 1.46 / .74 | *** | *** |
| -2 | *** | *** | *** | *** | *** | *** | *** | *** |

N★C DPS
DEPARTMENT OF PUBLIC SAFETY

# Insurance Rate Comparison

| Pre-/Post-FIRM[1] | Dwelling Type & # of Floors | Amount of Coverage Build/Content (in thousands) | Deductible[2] Build/Content | Flood Zone | Elevation Difference of Lowest Floor and BFE (Feet) | Cost of Flood Insurance[3] (without HFIAA surcharge) |
|---|---|---|---|---|---|---|
| **Post-** | Single Family/ One Floor/ No Basement | $200/$80 | $1,250/$1,250 | A1-30, AE | +4 | $528 |
| | | | | | +3 | $561 |
| | | | | | +2 | $649 |
| | | | | | +1 | $921 |
| | | | | | **At BFE** | **$1,874** |
| | | | | | -1 | $4,376 |
| **Post-1981** | Single Family/ Without Obstruction | $200/$80[5] | $1,250/$1,250 | V1-V30, VE | +4 or more | $2,752 |
| | | | | | +3 | $3,095 |
| | | | | | +2 | $4,245 |
| | | | | | +1 | $5,795 |
| | | | | | **At BFE** | **$7,356** |
| | | | | | -1 | $9,375 |
| **Post-1981** | Single Family/ With Obstruction | $200/$80[5] | $1,250/$1,250 | V1-V30, VE | +4 or more | $5,114 |
| | | | | | +3 | $5,407 |
| | | | | | +2 | $6,088 |
| | | | | | +1 | $7,039 |
| | | | | | **At BFE** | **$8,537** |
| | | | | | -1 | $10,714 |

# Support map amendments & revisions



| Page 1 of 3 | | Date: June 03, 2015 | Case No.: 15-04-4994A | LOMR-F |
|---|---|---|---|---|

Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION BASED ON FILL DETERMINATION DOCUMENT (REMOVAL)**

| COMMUNITY AND MAP PANEL INFORMATION | | LEGAL PROPERTY DESCRIPTION |
|---|---|---|
| COMMUNITY | TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA | Lots 6148, 6149 and 6150, Riverwood Athletic Club Alpine Valley, Phase 6E2, as shown on the Plat recorded in Plat Book 73, Page 131, in the Office of the Register of Deeds, Johnston County, North Carolina |
| | COMMUNITY NO.: 370139 | The portions of property are more particularly described by the following metes and bounds: |
| AFFECTED MAP PANEL | NUMBER: 3720176000J | |
| | DATE: 12/2/2005 | |
| FLOODING SOURCE: MARKS CREEK; NEUSE RIVER | | APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 35.636, -78.436<br>SOURCE OF LAT & LONG: GOOGLE EARTH PRO DATUM: NAD 83 |

DETERMINATION

| LOT | BLOCK/ SECTION | SUBDIVISION | STREET | OUTCOME WHAT IS REMOVED FROM THE SFHA | FLOOD ZONE | 1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88) | LOWEST ADJACENT GRADE ELEVATION (NAVD 88) | LOWEST LOT ELEVATION (NAVD 88) |
|---|---|---|---|---|---|---|---|---|
| 6148 | -- | Riverwood Athletic Club AV, Phase 6E2 | 433 Swanns Trail | Portion of Property | X (unshaded) | -- | -- | 160.0 feet |

**Special Flood Hazard Area (SFHA)** - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

LEGAL PROPERTY DESCRIPTION — PORTIONS REMAIN IN THE SFHA
DETERMINATION TABLE (CONTINUED) — STUDY UNDERWAY
FILL RECOMMENDATION

This document provides the Federal Emergency Management Agency's determination regarding a request for a Letter of Map Revision based on Fill for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the described portion(s) of the property(ies) is/are not located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). This document revises the effective NFIP map to remove the subject property from the SFHA located on the effective NFIP map; therefore, the Federal mandatory flood insurance requirement does not apply. However, the lender has the option to continue the flood insurance requirement to protect its financial risk on the loan. A Preferred Risk Policy (PRP) is available for buildings located outside the SFHA. Information about the PRP and how one can apply is enclosed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605.

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

The Elevation Certificate is used to revise a FEMA flood map by:

- Letter of Map Amendment (LOMA)
  - Changes the flood zone of a specific property.
- Letter of Map Revision (LOMR-F)
  - Changes the flood zone of a specific property where fill has been placed on the site.

# Federal Emergency Management Agency

Washington, D.C. 20472

## LETTER OF MAP AMENDMENT
## DETERMINATION DOCUMENT (OUT AS SHOWN)

| COMMUNITY AND MAP PANEL INFORMATION | | LEGAL PROPERTY DESCRIPTION |
|---|---|---|
| COMMUNITY | CITY OF LUMBERTON, ROBESON COUNTY, NORTH CAROLINA | Lot 13, Section II-B, Cliffridge Subdivision, as described in the North Carolina General Warranty Deed, recorded in Book 1114, Pages 0031 and 0032, in the Office of the Register of Deeds, Robeson County, North Carolina |
| | COMMUNITY NO.: 370203 | |
| AFFECTED MAP PANEL | NUMBER: 3720030200J | |
| | DATE: 1/19/2005 | |
| FLOODING SOURCE: MEADOW BRANCH; POLE CAT BRANCH | | APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 34.642, -78.993<br>SOURCE OF LAT & LONG: GOOGLE EARTH PRO DATUM: NAD 83 |

### DETERMINATION

| LOT | BLOCK/ SECTION | SUBDIVISION | STREET | OUTCOME WHAT IS OUTSIDE OF THE SFHA | FLOOD ZONE | 1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88) | LOWEST ADJACENT GRADE ELEVATION (NAVD 88) | LOWEST LOT ELEVATION (NAVD 88) |
|---|---|---|---|---|---|---|---|---|
| 13 | -/II-B | Cliffridge | 1007 Furman Drive | Structure | X (unshaded) | -- | -- | -- |

**Special Flood Hazard Area (SFHA)** - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

PORTIONS REMAIN IN THE SFHA
STUDY UNDERWAY

This document provides the Federal Emergency Management Agency's determination regarding a request for a Letter of Map Amendment for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the structure(s) on the property(ies) is/are not located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). The subject property is correctly shown outside the SFHA located on the effective NFIP map; therefore, the Federal mandatory flood insurance requirement does not apply. If the policy has been written using an incorrect zone, it can be endorsed to correct the zone for the current policy year and one prior policy term. Please contact the insurance agent or company involved to request endorsement of the policy. However, the lender has the option to continue the flood insurance requirement to protect its financial risk on the loan. A Preferred Risk Policy (PRP) is available for buildings located outside the SFHA. Information about the PRP and how one can apply is enclosed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605.

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

N★C DPS DEPARTMENT OF PUBLIC SAFETY

DEPARTMENT OF PUBLIC SAFETY NORTH CAROLINA Emergency Management

# Adding Fill to Raise LAG?

# Community Rating System & Elevation Certificates

The NFIP recognizes community efforts that go beyond the minimum floodplain management requirements of the NFIP through the CRS by reducing insurance premiums for the community's property owners

- Community Rating System (CRS) communities are required to obtain and maintain Elevation Certificates
- This requirement applies to all new construction and substantial improvements to existing structures located in SFHAs

# Who certifies building elevations?

**Surveyor** *Engineer* *Architect*

In order to be rated properly, the insured needs a professional like you to certify the building elevation information.

# EC Form Instructions

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
National Flood Insurance Program

## Instructions for Completing the Elevation Certificate

OMB No. 1660-0008
Expiration Date: July 31, 2015

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

# Community's EC Review

Community Officials MUST REVIEW EC's before excepting them to ensure:

- **Completeness**
- **Reasonableness/Accuracy**
- **Compliance**

If problems are found, return to professional for correction.

Structure will be in violation until proper Finished Construction Elevation Certificate is provided.

# Elevation Certificate Sections

**Section A** – Property Info
**Section B** – FIRM Info
**Section C** – Building Elevation (if BFE on maps)
**Section D** – Survey Certification
**Section E** – Building Elevation (no BFE)
**Section F** – Property Owner Certification
**Section G** – Community Info

# Section A (for all zones)

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
National Flood Insurance Program

## ELEVATION CERTIFICATE

**IMPORTANT:** Follow the instructions on pages 1–9.

OMB No. 1660-0008
Expiration Date: July 31, 2015

### SECTION A – PROPERTY INFORMATION

FOR INSURANCE COMPANY USE

Policy Number:

Company NAIC Number:

A1. Building Owner's Name

A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.

City **OR** State ZIP Code

A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) _____

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983

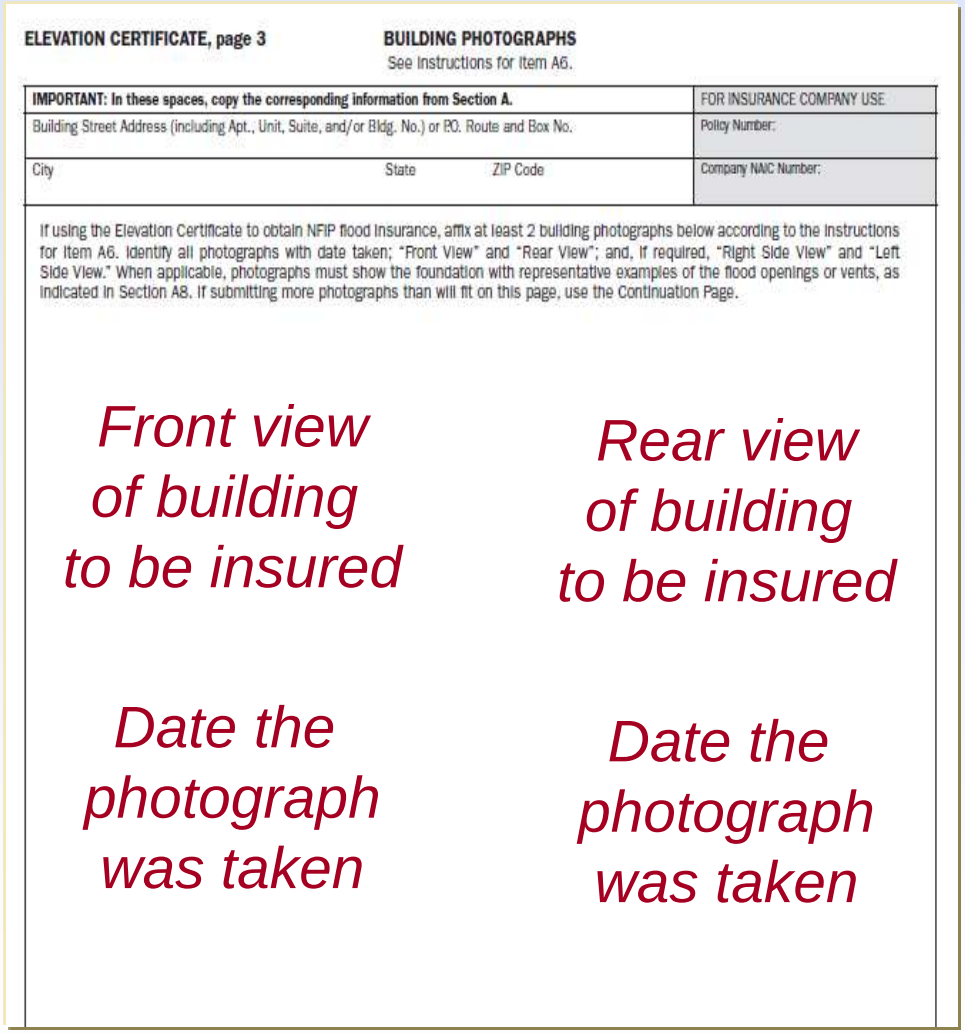
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.

A7. Building Diagram Number _____

A8. For a building with a crawlspace or enclosure(s):
- a) Square footage of crawlspace or enclosure(s) _____ sq ft
- b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____
- c) Total net area of flood openings in A8.b _____ sq in
- d) Engineered flood openings? ☐ Yes ☐ No

A9. For a building with an attached garage:
- a) Square footage of attached garage _____ sq ft
- b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____
- c) Total net area of flood openings in A9.b _____ sq in
- d) Engineered flood openings? ☐ Yes ☐ No

# Building Photographs



**ELEVATION CERTIFICATE, page 3**

**BUILDING PHOTOGRAPHS**
See Instructions for Item A6.

| **IMPORTANT: In these spaces, copy the corresponding information from Section A.** | | | FOR INSURANCE COMPANY USE |
|---|---|---|---|
| Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | | | Policy Number: |
| City | State | ZIP Code | Company NAIC Number: |

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.

*Front view of building to be insured*

*Rear view of building to be insured*

*Date the photograph was taken*

*Date the photograph was taken*

(A6) An additional form for attaching photographs is provided with the new Elevation Certificate.

- 3"x3" color photographs
- Digital is acceptable
- At least two photographs showing front and rear of building
- If building is split- or multi-level, at least 2 additional photographs are needed
- Helpful to show the lowest level of the building that is above grade.

# Building Photographs

**ELEVATION CERTIFICATE, page 4** **BUILDING PHOTOGRAPHS**
Continuation Page

| IMPORTANT: In these spaces, copy the corresponding information from Section A. | FOR INSURANCE COMPANY USE |
|---|---|
| Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | Policy Number: |
| City State ZIP Code | Company NAIC Number: |

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.

*Right side view of the building to be insured*

*Left side view of the building to be insured*

*Date the photograph was taken*

*Date the photograph was taken*

- Include the date the photograph was taken
  - Must be taken within 90 days from the date of certification
- Photographs should capture key elements such as flood openings

# Sections A1-A3

| SECTION A – PROPERTY INFORMATION | | FOR INSURANCE COMPANY USE |
|---|---|---|
| A1. Building Owner's Name | | Policy Number: |
| A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | | Company NAIC Number: |
| City | State | ZIP Code |
| A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) | | |
| A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) _____ | | |

- Complete **all** items, except "For Insurance Company Use".
- A1. Building Owner's(s') Name(s)
- A2. **Building Address** - 911 address of building location.
- A3. The address is a rural route, enter the lot & block numbers, the tax parcel number, the legal description.

# Section A4

| SECTION A – PROPERTY INFORMATION | | FOR INSURANCE COMPANY USE |
|---|---|---|
| A1. Building Owner's Name | | Policy Number: |
| A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | | Company NAIC Number: |
| City | State | ZIP Code |
| A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) | | |
| A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) _____ | | |

- A4. **Building Use** - residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure.
- **Use the <u>Comments</u> area on page 2 or attach additional comments, as needed.**

# Section A5

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ 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 _____

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) _____ sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A8.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

A9. For a building with an attached garage:

a) Square footage of attached garage _____ sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

- Latitude/Longitude taken at the center of the front of the building.
- Decimal degrees: provide coordinates to at least 4 decimal places or better (e.g., 39.5043°, -110.7585°).
- Coordinates must be accurate within 66 feet.
- Provide the type of datum used - FEMA prefers the use of NAD 1983.

# Sections A6-A7

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ 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 _____

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) _____ sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A8.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

A9. For a building with an attached garage:

a) Square footage of attached garage _____ sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

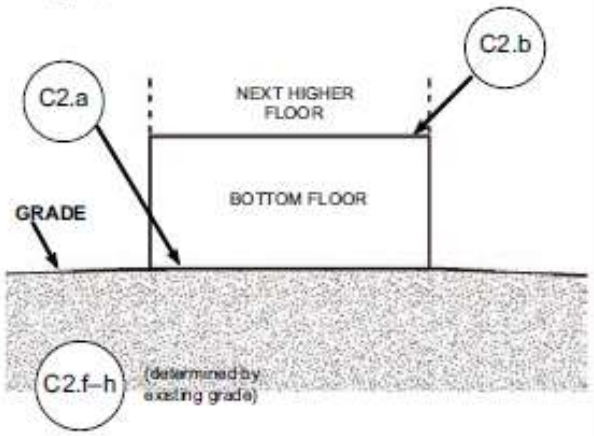
d) Engineered flood openings? ☐ Yes ☐ No

- A6. Attach photographs showing **at least** the front & rear of the building. **Must be in color** & measure at least 3”x3”. If split-level or multi-level, side views are also required.
- A7. Enter the **building diagram number** that best represents the building. There are now 10 building diagrams.

## DIAGRAM 1A

**All slab-on-grade single- and multiple-floor buildings (other than split-level) and high-rise buildings, either detached or row type (e.g., townhouses); with or without attached garage.**

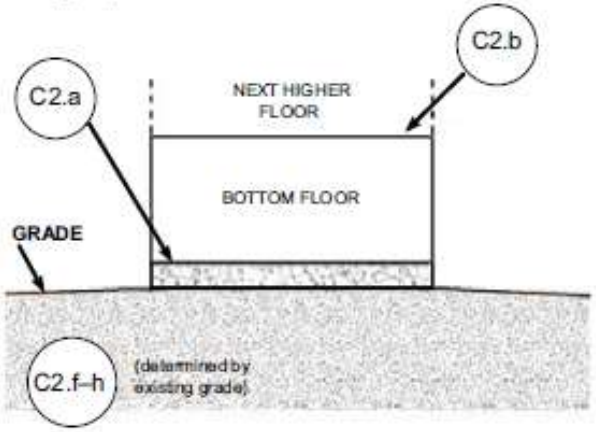
**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least 1 side.*




## DIAGRAM 1B

**All raised-slab-on-grade or slab-on-stem-wall-with-fill single- and multiple-floor buildings (other than split-level), either detached or row type (e.g., townhouses); with or without attached garage.**

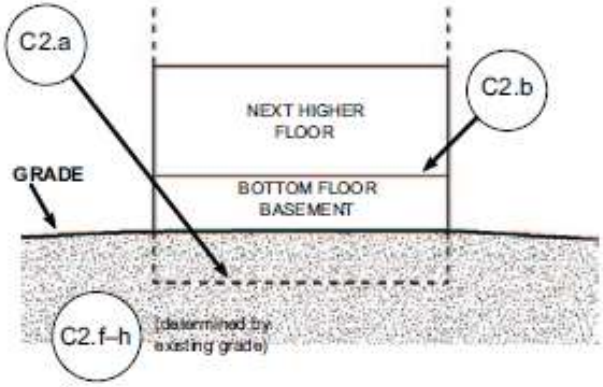
**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least 1 side.*




## DIAGRAM 2

**All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.**

**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*

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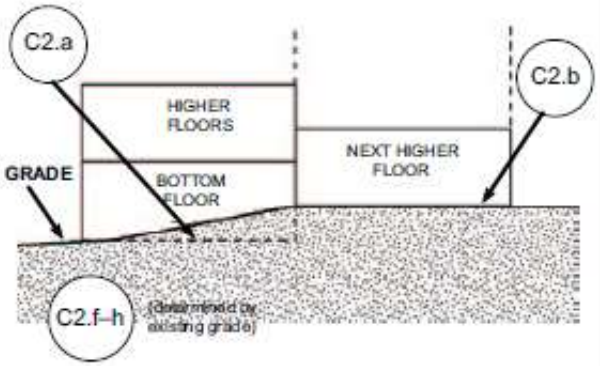
## DIAGRAM 3

**All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.**

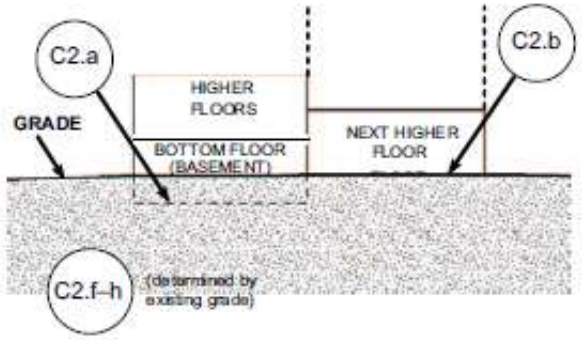
**Distinguishing Feature** – The bottom floor (excluding garage) is at or above ground level (grade) on at least 1 side.*




## DIAGRAM 4

**All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.**

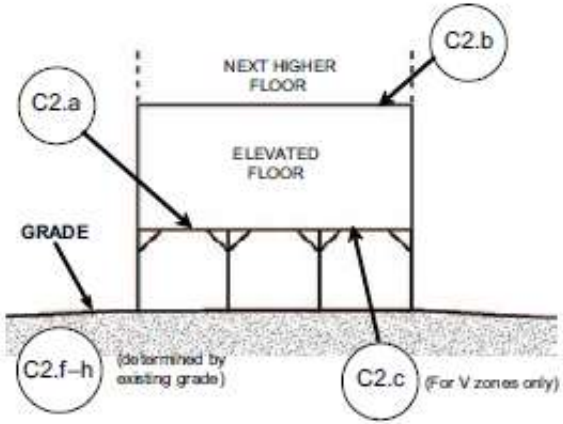
**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*




## DIAGRAM 5

**All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.**

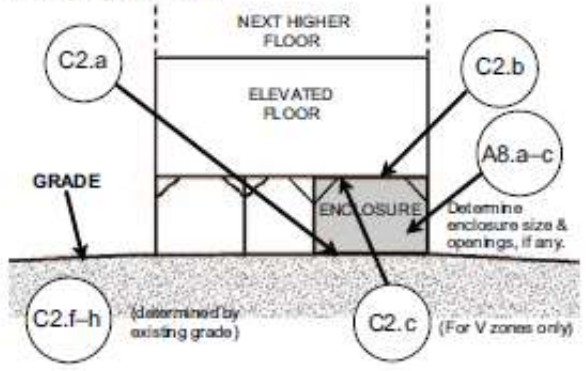
**Distinguishing Feature** – For all zones, the area below the elevated floor is open, with no obstruction to flow of floodwaters (open lattice work and/or insect screening is permissible).




## DIAGRAM 6

**All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.**

**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

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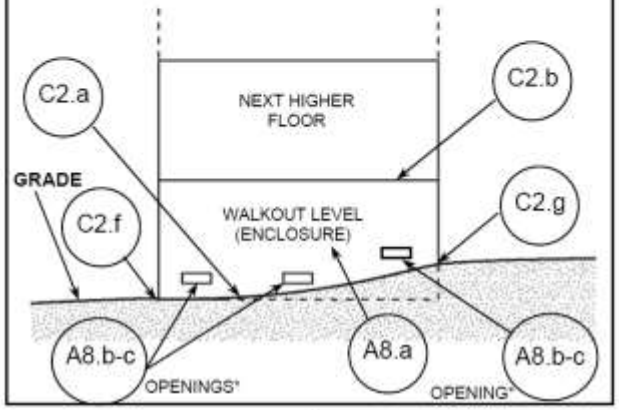
## DIAGRAM 7

**All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least one side is at or above grade. The principal use of this building is located in the elevated floors of the building.**

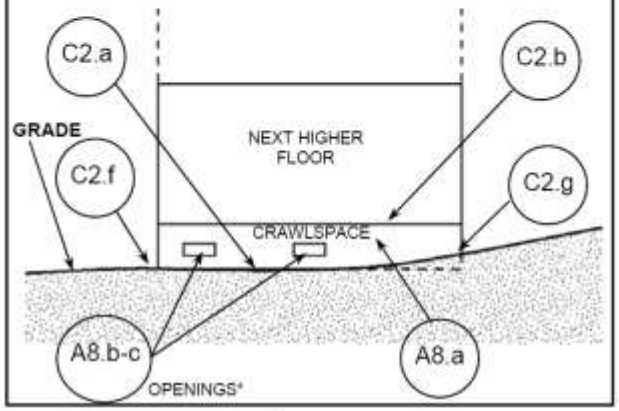
**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.




## DIAGRAM 8

**All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least one side, with or without an attached garage.**

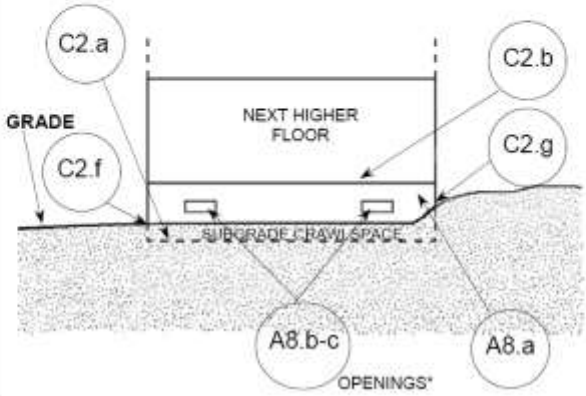
**Distinguishing Feature** – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings* present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property Information.




## DIAGRAM 9

**All buildings (other than split-level) elevated on a sub-grade crawlspace, with or without attached garage.**

**Distinguishing Feature** – The bottom (crawlspace) floor is at or below ground level (grade) on all sides.** (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, or the crawlspace floor is more than 2 feet below the grade (LAG) on all sides, use Diagram 2.)

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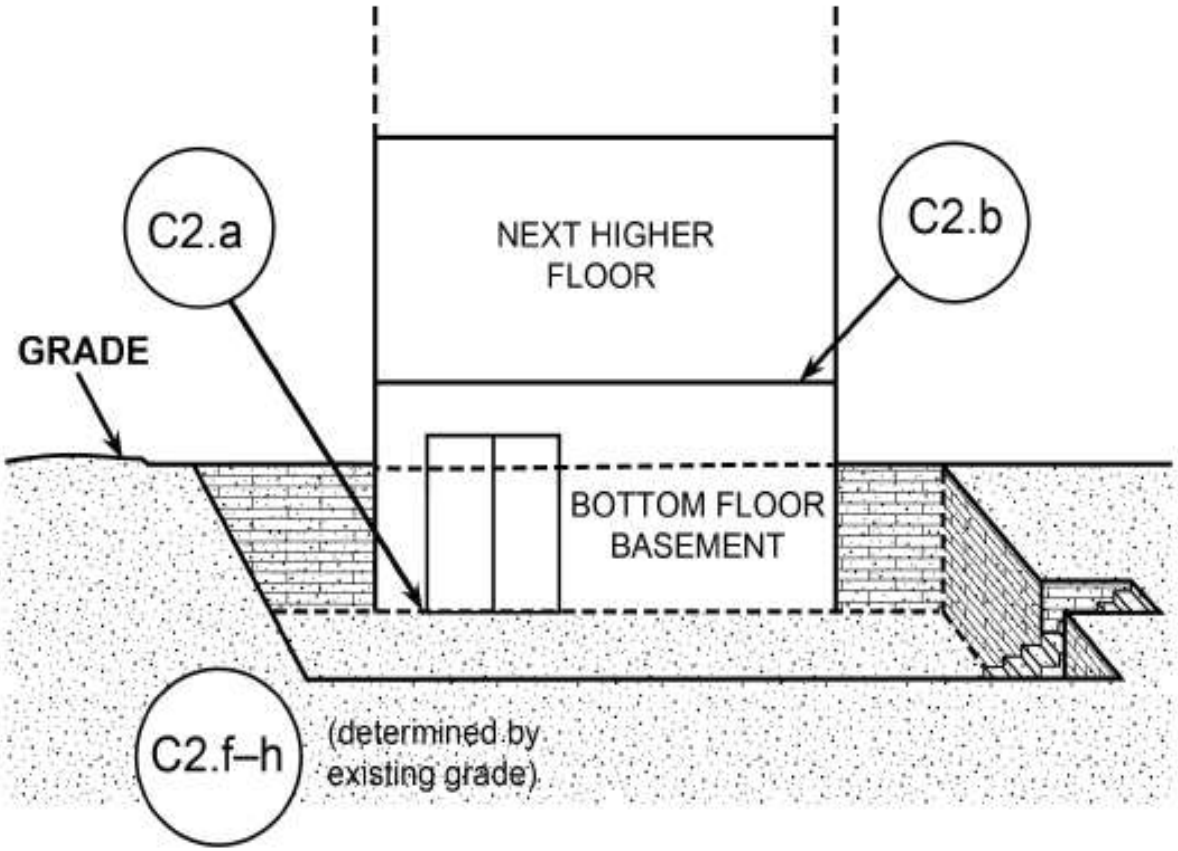
## DIAGRAM 2B

**All single-and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage).**

**Distinguishing feature** - The bottom floor (basement or under ground garage) is below ground level (grade) on all sides; most of the height of the walls are below ground level on all sides and the door and area of egress is also below ground level on all sides.*




DEPARTMENT OF PUBLIC SAFETY

DEPARTMENT OF PUBLIC SAFETY NORTH CAROLINA Emergency Management

# Section A8a-b

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ 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 _____

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) _____ sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A8.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

A9. For a building with an attached garage:

a) Square footage of attached garage _____ sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

For buildings with a crawlspace or enclosure(s).

- A8.a. Square footage of crawlspace or enclosure(s). Take measurements from the outside.
- A8.b. Number of permanent flood openings in the crawlspace or enclosure(s) that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening

# Section A8c

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ 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 _____

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) _____ sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A8.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

A9. For a building with an attached garage:

a) Square footage of attached garage _____ sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

- A8.c. Calculate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings.

If the net area cannot be calculated, provide the size of the flood openings without consideration of any covers & indicate in the Comments area the type of cover that exists in the flood openings.

# Section A8d

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ 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 _____

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) _____ sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A8.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

A9. For a building with an attached garage:

a) Square footage of attached garage _____ sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

- A8.d. Engineered flood openings. Attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it.

If the crawlspace or enclosure(s) have no permanent flood openings, or if the openings are not within 1.0 foot above adjacent grade, enter "0" (zero) in Items A8.b-c.

FEMA Technical Bulletin 1: "Openings in Foundation Walls and Walls of Enclosures"

# Standards for Elevation
## on Perimeter Wall Foundations

- In Zones A & AE, fully enclosed areas below the lowest floor shall be designed to automatically equalize hydrostatic flood forces on walls by allowing for the entry & exit of floodwaters
- To meet this requirement, the openings must be:
  - certified by a registered engineer or architect, **OR**
  - meet or exceed the minimum opening requirements

# Hydrostatic Openings

Permanent Opening in a Wall that Allows the Free Passage of Water in Both Directions, **AUTOMATICALLY**, without Human Intervention.

A Window, a Door, or a Garage Door is **NOT** Considered an Opening.

# Minimum Requirements for Foundation Openings

- Minimum of two openings on different sides of each enclosed area.
- The total net area of all openings must be at least one (1) square inch for each square foot of enclosed area.
- The bottom of all required openings shall be no higher than one foot above the adjacent grade at each opening.
- Openings may be equipped with screens, louvers, or other "automatic" coverings or devices, provided they permit the automatic flow of floodwaters in both directions.


Net area?


1 foot?

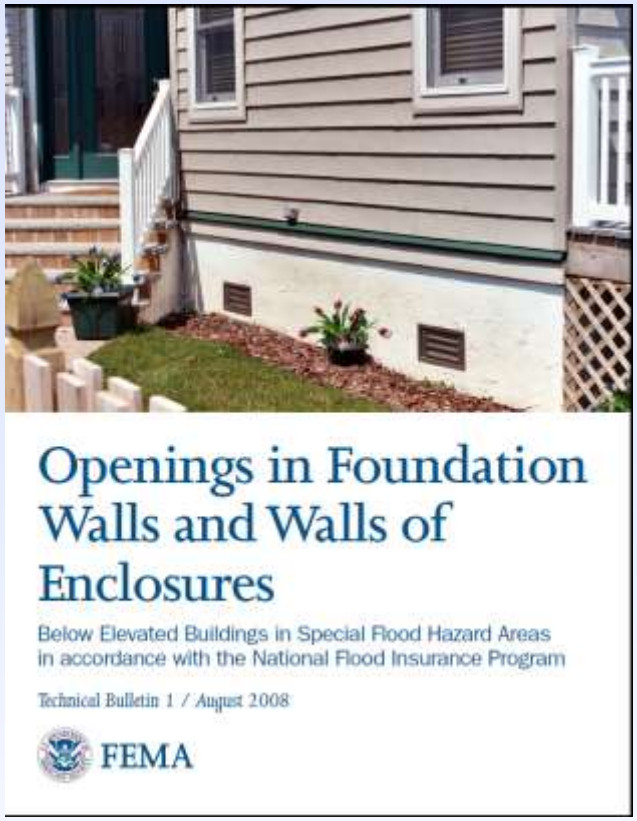

This looks like 1 foot or less.

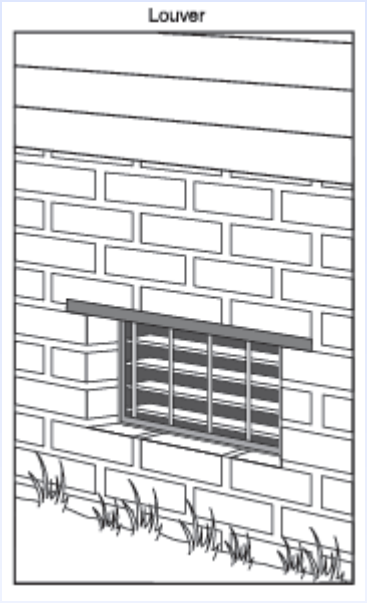

This looks like 1 foot or less.


This is compliant


Plexiglas cover. This is a violation!!


Spray foam insulation. This is a violation!!




**Page 17: Openings that extend above the BFE**

Only those portions of openings that are below the BFE can be counted towards the required net open area.

# Engineered Openings/Vents

## Plastic – No Rust or Rot Crawlspace Flood Vent for Homes (New Construction & Replacement)

*Easy Access • Modular Use • Can Be Painted*

| Model Number | Opening Sizes (HxW) | Non Eng. (Sq. In.) | Eng. (Sq. In.) | Net-Free Air (Sq. In.) |
|---|---|---|---|---|
| D0816 | 8" X 16" | 120 | 230 | 95 |
| D1220 | 12" X 20" | 240 | 425 | 175 |
| D1232 | 12" X 32" | 380 | 705 | 290 |
| D1616 | 16" X 16" | 255 | 485 | 200 |
| D1624 | 16" X 24" | 380 | 695 | 285 |
| D1632 | 16" X 32" | 510 | 935 | 385 |
| D2032 | 20" X 32" | 640 | 1,225 | 505 |
| D2424 | 24" X 24" | 575 | 1,065 | 435 |
| D2436 | 24" X 36" | 860 | 1,620 | 665 |

### Flood Vent (No Cover)

One-piece ventplate with easy to insert vermin screen and fixed louver. Made of durable PVC/ABS plastic (no rust or rot) with a UV retardant treatment.
FEMA compliant. No cover to allow the automatic entry and exit of floodwaters.
Quick and easy to install.


Crawl Space Door Systems
INCORPORATED
*Plastic Crawlspace Doors & Vents*
*Plastic Crawlspace Louvers/Screens*
*Plastic FEMA Flood Vents*

3700 Shore Drive, Virginia Beach, VA 23455
757.363.0005 • 1.800.230.9598 • www.crawlspacedoors.com

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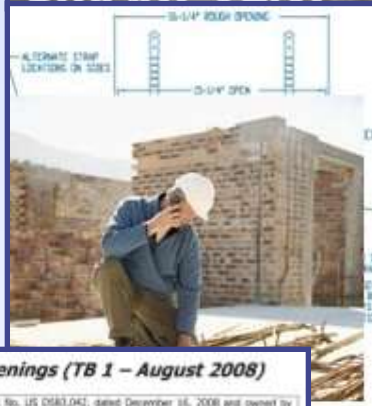
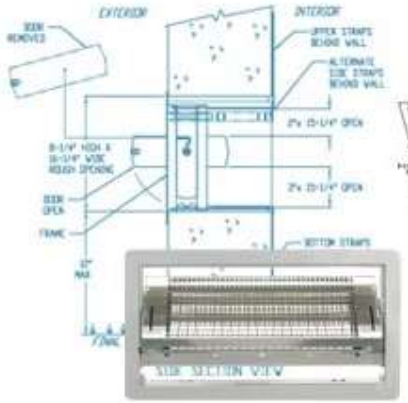
## SMART VENT

ICC ES
FEMA ACCEPTED
ICC-ES EVALUATED





## Flood Openings (TB 1 – August 2008)

...OOD LOUVER, Patent No. US D580,042, dated December 16, 2008 and owned by ...and sized in accordance with Federal Emergency Management Agency's National ...ational Flood Insurance Program, Technical Bulletin (TB) 1-August 2008 will allow ...s on exterior walls by allowing for entry and exit of floodwater during floods up to ...

...gineered, Net-Free Air and Engineered Opening size for each model and size of the ...corded in the table below. The Engineered size opening calculation was performed ...ings in Foundation Walls for Buildings Located in Special Flood Hazard Areas in ...n and ASCE/SEI 24-05, Flood Resistance Design and Construction. I measured the ...es to determine the Non-Engineered and Net-Free Air opening size for each model. ...Aug 2008 to determine the Engineered opening size for each model. I used the ...required (in2); 0.033 = coefficient corresponding to a factor of safety of 5.0 (in2 - ...2 "rectangular, long axis horizontal, short axis vertical unobstructed during design ...between the louvers); R = 5 ft/hr worst case rate of rise and fall; and AE = 1 ft2

0.033 [1/0.40] 5 = .4125 in2

D0816: = 95/.4125 = 230

| | | Engineered (Sq. Inches) | Net-Free Air (Sq. Inches) | Engineered (Sq. Inches) |
|---|---|---|---|---|
| D0816 | 8" x 16" | 120 | 95 | 230 |
| D1220 | 12" x 20" | 240 | 175 | 425 |
| D1232 | 12" x 32" | 380 | 290 | 705 |
| D1616 | 16" x 16" | 255 | 200 | 485 |
| D1624 | 16" x 24" | 380 | 285 | 695 |
| D1632 | 16" x 32" | 510 | 385 | 935 |
| D2032 | 20" x 32" | 640 | 505 | 1,225 |
| D2424 | 24" x 24" | 575 | 435 | 1,065 |
| D2436 | 24" x 36" | 860 | 665 | 1,620 |

**Installation Limitations and Instructions**

Each individual opening, and any louvers, screens, or other covers, shall be designed to allow automatic entry and exit of floodwaters during design flood or lesser flood conditions; there shall be a minimum of two different sides of each enclosed area; if a structure has more than one enclosed area below the BFE, each area shall have openings; openings shall not be less than 3 in. in any direction in the plane of the wall; the bottom of each required opening shall be no more than 1 ft above the adjacent ground level; the difference between the exterior floodwater [illegible] shall not exceed 1 ft; in the absence of reliable data on the rates of rise and fall, assume a minimum rate of rise and fall of 5 ft/h.

Signature: [signature]
Title: PRESIDENT - HOUSE ENGINEERING, P.C.
Type of License: PROFESSIONAL ENGINEER
License Number: 24740


Smart VENT
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www.smartvent.com

DETAIL DIAGRAM
MODEL 1540-520
FLOOD VENT INSULATED

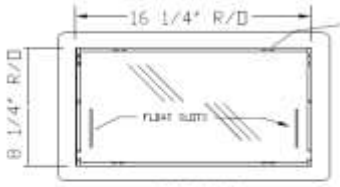



FIGURE 1
Front View

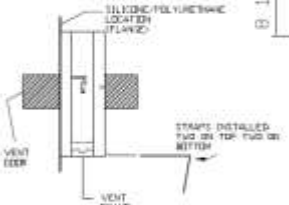
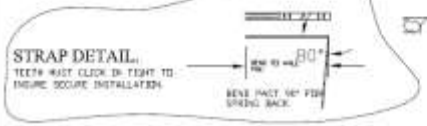



FIGURE 2
Side View


FIGURE 3
Side View




SMART VENT
877-441-8368
FLOOD VENT INSULATED
MODEL 1540-520
1540-520

# Section A9

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ 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____

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) _____ sq ft

b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A8.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

A9. For a building with an attached garage:

a) Square footage of attached garage _____ sq ft

b) No. of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

d) Engineered flood openings? ☐ Yes ☐ No

- Same as Section A8, but for garage when the garage is attached to the building.
- Use the Comments area on page 2 or attach additional comments, as needed.

# Sections B1-B9

| SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION | | | | | |
|---|---|---|---|---|---|
| B1. NFIP Community Name & Community Number | | | B2. County Name | | B3. State |
| B4. Map/Panel Number | B5. Suffix | B6. FIRM Index Date | B7. FIRM Panel Effective/ Revised Date | B8. Flood Zone(s) | B9. Base Flood Elevation(s) (Zone AO, use base flood depth) |

- B1. Enter name of Community which has permitting jurisdiction.
- B4. Enter the 10 digit panel number.
- B5. Enter the panel suffix (letter following panel number).
- B6. Enter the date from the FIRM Index Panel.
- B7. Enter the FIRM panel effective date.
- B8. Enter the Flood Zone(s) related to the structure.
- B9. Enter the Base Flood Elevation (BFE) for the structure to the nearest tenth of a foot.

# Section B1-9

**SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION**

| B1. NFIP Community Name & Community Number | | | B2. County Name | | B3. State |
|---|---|---|---|---|---|
| B4. Map/Panel Number | B5. Suffix | B6. FIRM Index Date | B7. FIRM Panel Effective/ Revised Date | B8. Flood Zone(s) | B9. Base Flood Elevation(s) (Zone AO, use base flood depth) |
| | | | | | |

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9:
☐ FIS Profile ☐ FIRM ☐ Community Determined ☐ Other/Source: _____

B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☐ No
Designation Date: ____ / ____ / ____ ☐ CBRS ☐ OPA

- Complete the Elevation Certificate on the basis of the **FIRM in effect at the time of the certification**.
- Additional &/or preliminary data may be provided in Comments Section.

# Sections B10-B12

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.

☐ FIS Profile ☐ FIRM Community Determined ☐ Other (Describe) _____

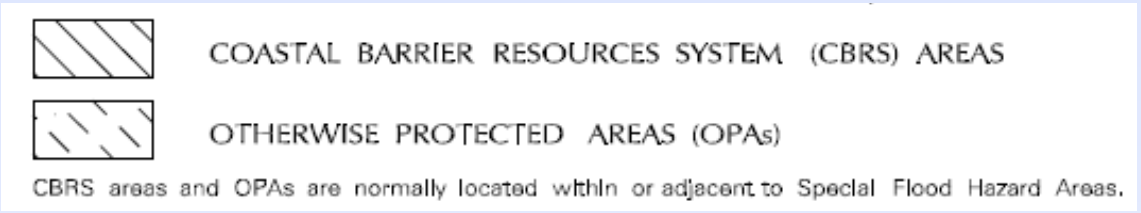
B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe) _____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☐ No

Designation Date_____ ☐ CBRS ☐ OPA

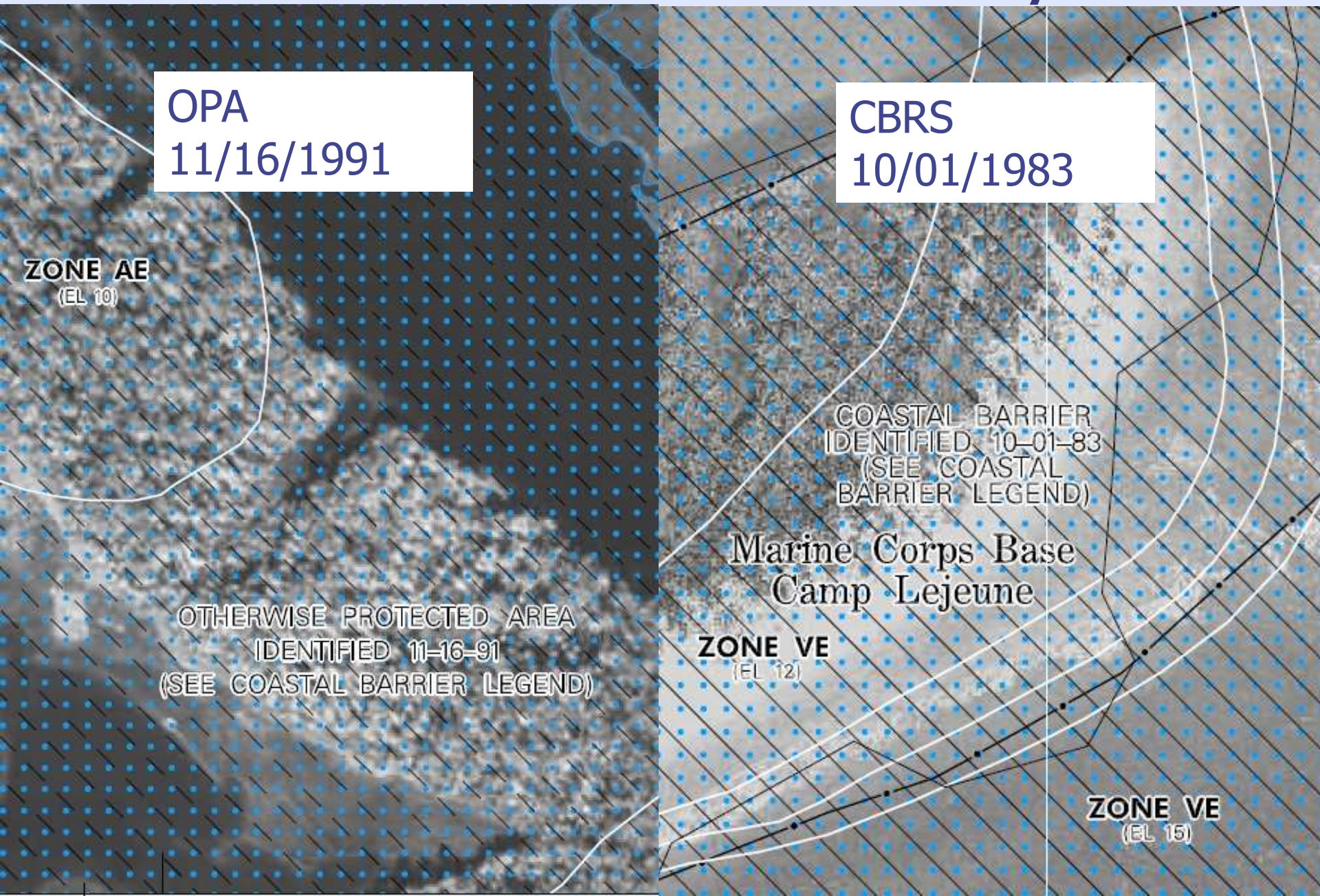
- B10. Check the box for source of BFE data. These are listed in the order of preference. If the flooding source is riverine, the "FIS Profile" box should be selected.
- B11. Check the box for elevation datum used in Item B9. NC maps currently use NAVD 1988.
- B12. Indicate whether or not the building is located in a Coastal Barrier Resource System (CRBS) or Otherwise Protected Area (OPA). Enter the designation date & check "CBRS" or "OPA".

# Coastal Barrier Resource System




Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. Information about CBRS areas & OPAs may be obtained on the FEMA web site at: http://www.fema.gov/business/nfip/cbrs/cbrs.shtm

# Coastal Barrier Resource System



# Complete Two Ways

Either:

- SFHA Zone **with BFEs** Determined
  - Sections C & D

- SFHA Zone **with No BFE** Determined
  - Is rare in Eastern NC

# Section C (Zone has BFE)

## 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: _____ Vertical Datum: _____

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) | _____ . _____ | ☐ feet | ☐ meters |
| b) Top of the next higher floor | _____ . _____ | ☐ feet | ☐ meters |
| c) Bottom of the lowest horizontal structural member (V Zones only) | _____ . _____ | ☐ feet | ☐ meters |
| d) Attached garage (top of slab) | _____ . _____ | ☐ feet | ☐ meters |
| e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | _____ . _____ | ☐ feet | ☐ meters |
| f) Lowest adjacent (finished) grade next to building (LAG) | _____ . _____ | ☐ feet | ☐ meters |
| g) Highest adjacent (finished) grade next to building (HAG) | _____ . _____ | ☐ feet | ☐ meters |
| h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | _____ . _____ | ☐ feet | ☐ meters |

Section C now states the Datum used in this section must match the datum used for the BFE

# Section C1

**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.

- Item C1. The elevations to be entered in this section are based on **construction drawings**, a **building under construction**, or **finished construction**.
- Use the Comments area of Section D as needed.
- "Finished Construction" is only when all machinery &/or equipment (furnaces, hot water heaters, heat pumps, air conditioners, elevators & their associated equipment) have been installed & the grading around the building is completed.

# Section C2

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: _____ Vertical Datum: _____

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.

- A field survey is required for Items C2.a-h.
- Enter the Benchmark Utilized. Provide the PID or other unique identifier assigned by the maintainer of the benchmark. For GPS survey, indicate the benchmark used for the base station, the Continuously Operating Reference Stations (CORS) sites used for an On-line Positioning User Service (OPUS) solution (attach the OPUS report), or the name of the Real Time Network used.
- Note the Vertical Datum. All elevations for the certificate **must** use the same datum on which the BFE is based.

# Bench Marks

BM5510  North Carolina Geodetic Survey bench mark

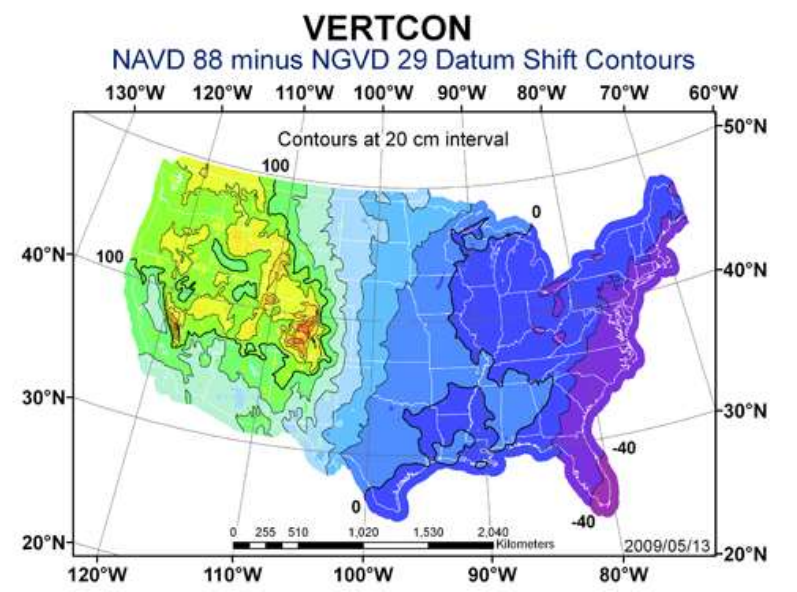
BM5510  National Geodetic Survey bench mark

BM5510  Contractor bench mark (approved by NCGS)

- Identified by their NSRS Permanent Identifier (PID)
- To access current Bench Mark elevation, description, & location information, go to:
- NC Geodetic Survey website: www.ncgs.state.nc.us

  Or
- National Geodetic Survey website: www.ngs.noaa.gov

# http://www.ngs.noaa.gov/TOOLS/Vertcon/vertcon.html




## Orthometric Height Conversion

Orthometric height conversion is performed by calculating the datum shift based from modeled values
The resulting datum shift is displayed.
The converted orthometric height is displayed only if the height to be converted from was not left blan
***** See input format details below *****

### Latitude and Longitude within the Contiguous United States are REQUIRED:

```
Positions may be entered in any of the following three formats:
  1. degrees, minutes and decimal seconds (including leading zeros)
     Lon: (XXX XX XX.XXX)            Lat: (XX XX XX.XXX)
     Lon: 098 33 23.232  good        Lat: 45 33 23.232  good
     Lon:  98 33 23.232  bad         Lat:  5 33 23.232  bad
     Lon: 098 03 23.342  good        Lat: 45 03 03.232  good
     Lon: 098  3 23.342  bad         Lat: 45  3  3.232  bad
  2. degrees and decimal minutes (including leading zeros)
     Lon: (XXX XX.XXX)               Lat: (XX XX.XXX)
     Lon: 098 23.232  good           Lat: 45 33.232  good
     Lon:  98 23.232  bad            Lat:  5 23.232  bad
     Lon: 098 03.342  good           Lat: 45 03.232  good
     Lon: 098  3.342  bad            Lat: 45  3.232  bad
  3. decimal degrees (including leading zeros)
     Lon: (XXX.XXX)                  Lat: (XX.XXX)
     Lon: 098.232  good              Lat: 45.232  good
     Lon:  98.232  bad               Lat:  5.232  bad

Note: There MUST be one or more blanks between entry fields
      Decimals can be keyed commensurate with the field's precision, but are not req
```

### Orthometric Height to be converted FROM is OPTIONAL:

```
Height may be entered in either meters or U.S. survey feet:
  1. meters:  xxxx.xxx
  2. feet  :  xxxx.xx  FT  ( MUST include FT or ft for feet !)
```

ENTER North Latitude :.....

ENTER West Longitude :.....

ENTER Orthometric Height : -- Entry is Optional; Default units (meters) --

SELECT Vertical Datum :... ◉ NGVD 29 ○ NAVD 88 -- of the entered height --

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# Section C2.a-d

| | | Check the measurement used. | |
|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) _____._____ | ☐ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor _____._____ | ☐ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) _____._____ | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) _____._____ | ☐ feet | ☐ meters (Puerto Rico only) |

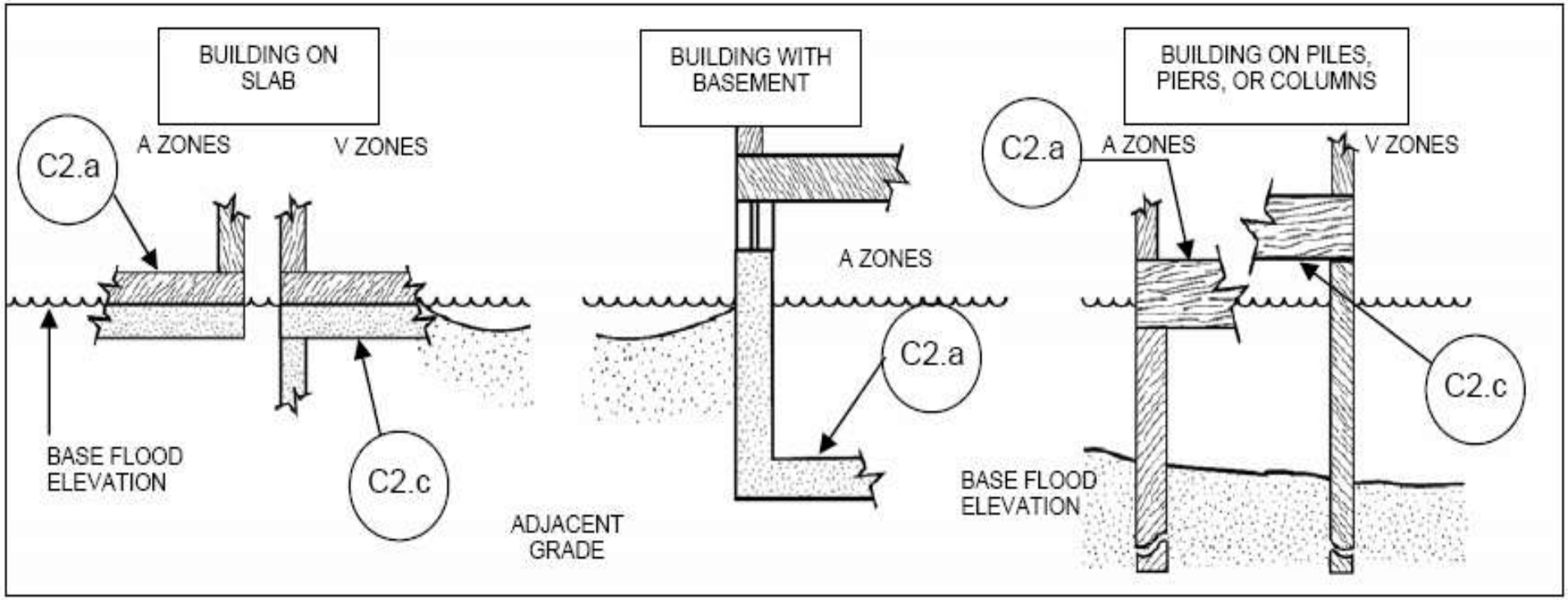
- Items C2.a-c. Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7).
- If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d.
- If any item does not apply to the building, enter "N/A" for not applicable.

# Section C2.a-d

| | | Check the measurement used. | |
|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |

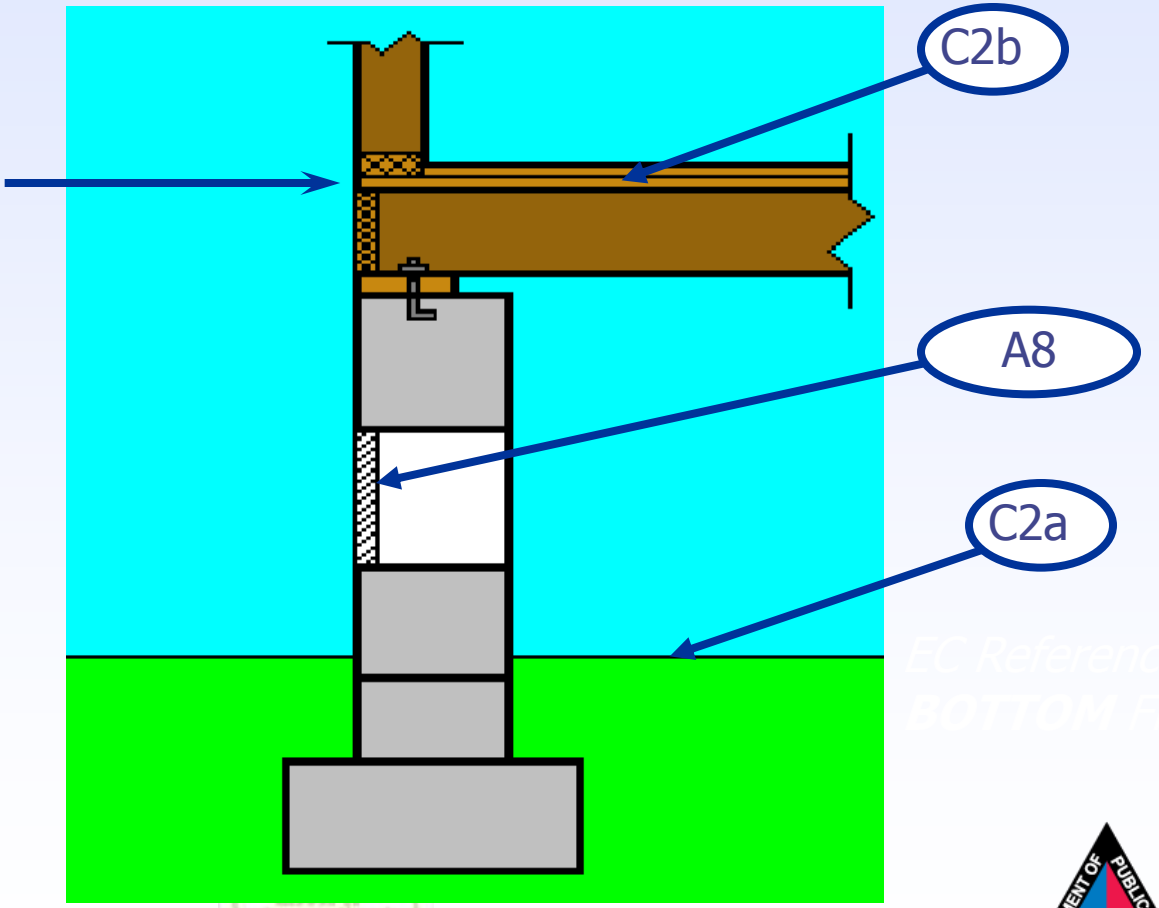
- For buildings in **A** zones: elevations should be measured at the **top of the floor**.
- For buildings in **V** zones: Item C2.c. Elevation c must be measured at **the bottom of the lowest horizontal structural member of the floor**.
- For buildings elevated on a crawlspace enter the elevation of the top of the crawlspace floor in Item C2.a, whether or not the crawlspace has permanent flood openings (flood vents).

# Section C2.a and C2.c



# Lowest Floor in ZONE A, AE, AH & A1-30

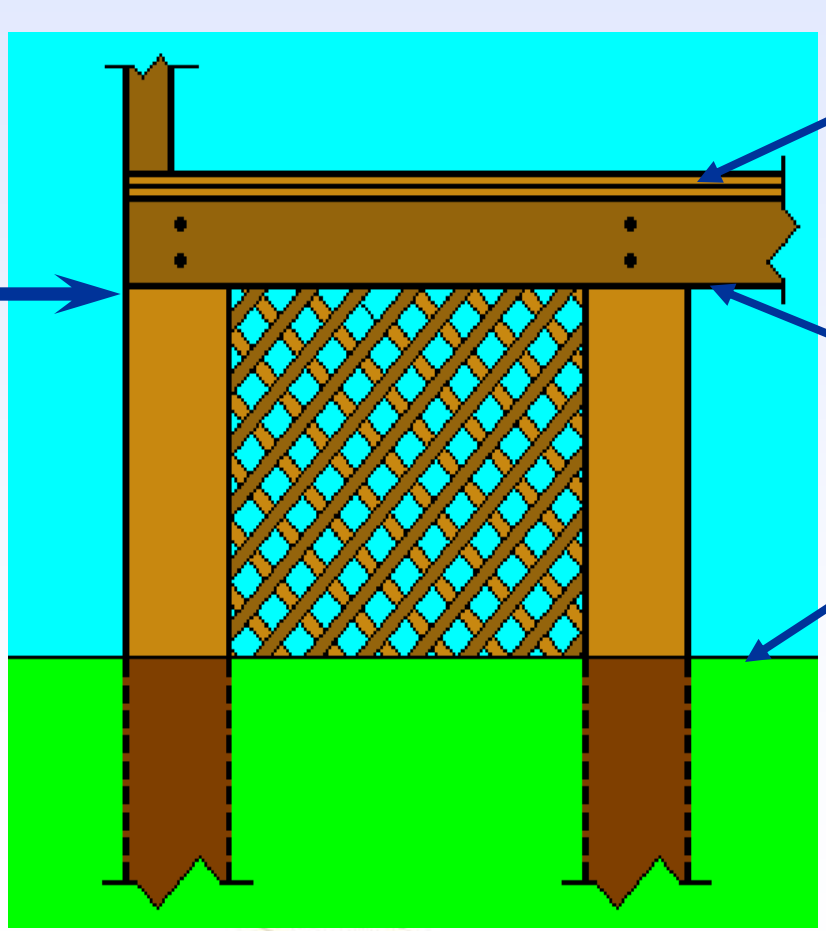
The lowest floor is measured at the top of the sub-floor, slab or grade for regulatory and flood insurance purposes




EC References to BOTTOM Floor

# Lowest Floor in ZONE V, & VE

Bottom of the lowest horizontal structural member supporting the lowest floor

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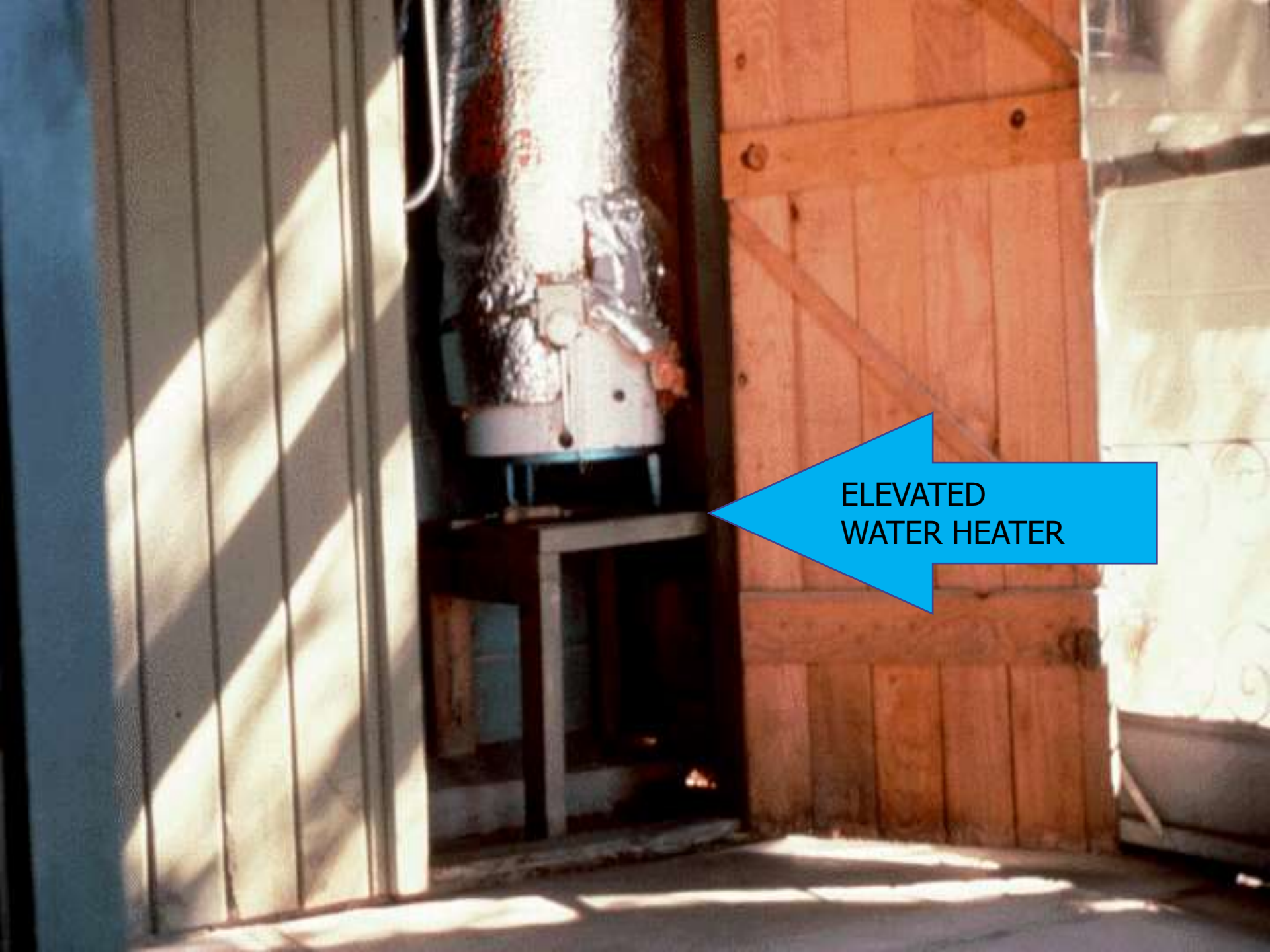
# Section C2.e

| | | | | |
|---|---|---|---|---|
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) | _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) | _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |

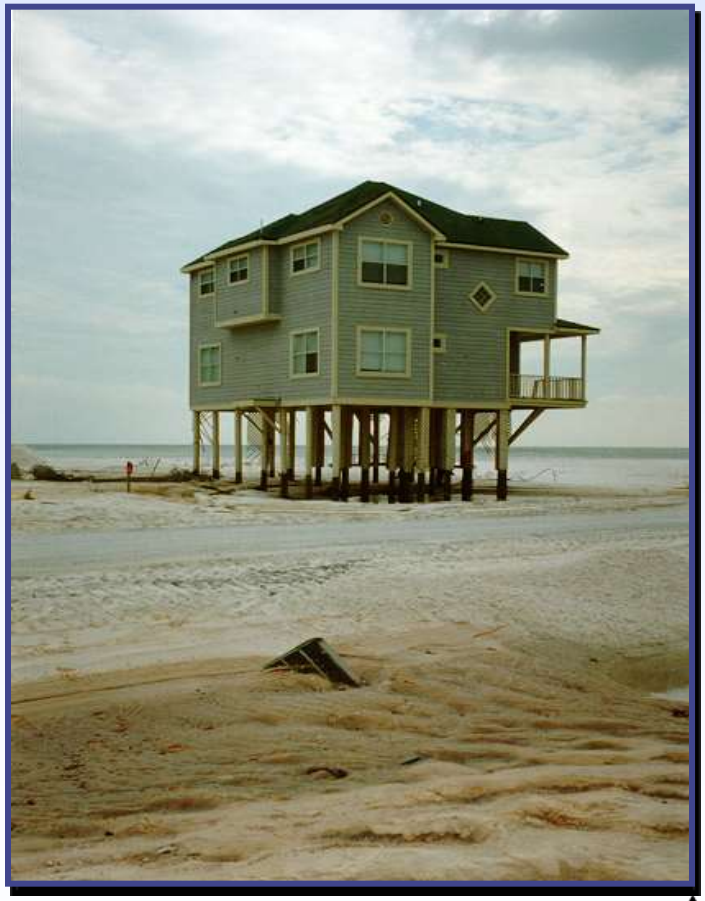
- Enter the lowest platform elevation of the machinery & equipment.
- The elevation(s) for machinery & equipment are required in order to rate the building for flood insurance.
- Local officials are required to ensure that all machinery & equipment servicing the building are protected from flooding, including ductwork, be documented on the Elevation Certificate.
- If the machinery or equipment is mounted to a wall, pile, etc., indicate machinery/equipment type & its location (on floor inside garage, on platform affixed to exterior wall, etc.) in the Comments area.


ELEVATED
AIR CONDITIONER


ELEVATED
WATER HEATER


ELEVATED
ELECTRIC METERS

- Compliant: elevated equipment and ducts; anchored tank



# Section C2.f-h

| | | | | |
|---|---|---|---|---|
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) | _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) | _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |

- Item C2.f. Enter the lowest elevation of the ground, sidewalk, or patio slab immediately next to the building.
- Item C2.g. Enter the highest elevation of the ground, sidewalk, or patio slab immediately next to the building.
- Item C2.h. Enter the lowest grade elevation at the deck support, or stairs.

**These measurements must be to the nearest tenth of a foot.**

# Section D

***Official certification required***

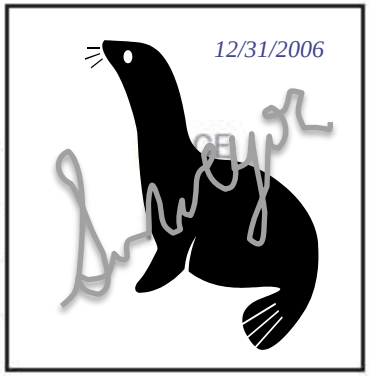
**SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION**

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.*

☐ Check here if comments are provided on back of form.
☐ Check here if attachments.

Were latitude and longitude in Section A provided by a licensed land surveyor? ☐ Yes ☐ No

| Certifier's Name | | License Number | |
|---|---|---|---|
| Title | Company Name | | |
| Address | City | State | ZIP Code |
| Signature | Date | Telephone | |




*2009 Form:*
*New, lat/long verification*

# Section D (cont.)

| IMPORTANT: In these spaces, copy the corresponding information from Section A. | | | For Insurance Company Use: |
|---|---|---|---|
| Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | | | Policy Number |
| City | State | ZIP Code | Company NAIC Number |

**SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)**

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

Comments

Signature Date

☐ Check here if attachments

- *Use this comment section to provide additional information, as appropriate.*
- *USE….USE…..USE*

# Section E

***Primarily for AO and A zones without BFE***

**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 8–9 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.

- *Complete this section if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C.*

# Section F (if zone has no BFE)

(very rare in Eastern NC)

| 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's or Owner's Authorized Representative's Name | | | |
| Address | City | State | ZIP Code |
| Signature | Date | Telephone | |
| Comments | | | |
| ☐ Check here if attachments | | | |

Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner's representative when responding to Sections A, B, & E. The address entered in this section must be the **actual mailing address** of the property owner or property owner's representative who provided the information on the certificate.

# Section G (All Zones)

**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 and G9.

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-G9) is provided for community floodplain management purposes.

| G4. Permit Number | G5. Date Permit Issued | G6. Date Certificate Of Compliance/Occupancy Issued |
|---|---|---|
| | | |

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 (PR) Datum_____

G9. BFE or (in Zone AO) depth of flooding at the building site _____. _____ ☐ feet ☐ meters (PR) Datum_____

G10. Community's design flood elevation _____. _____ ☐ feet ☐ meters (PR) Datum_____

| Local Official's Name | Title |
|---|---|
| Community Name | Telephone |
| Signature | Date |
| Comments | |

- *Community officials can transfer information from a previously certified document.*

# Photographs

**ELEVATION CERTIFICATE, page 3**

**BUILDING PHOTOGRAPHS**

See Instructions for Item A6.

| **IMPORTANT: In these spaces, copy the corresponding information from Section A.** | | | FOR INSURANCE COMPANY USE |
|---|---|---|---|
| Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | | | Policy Number: |
| City | State | ZIP Code | Company NAIC Number: |

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.

**At least 2 color photographs, 3" x 3"**
**EC requires foundation vent photos**

# Question 1

*The main purpose of the Elevation Certificates is to certify a building's compliance with local floodplain regulations.*

___ *True*
___ *False*

# Answer 1

*The main purpose of the Elevation Certificates is to certify a building's compliance with local floodplain regulations.*

___ *True*
_X_ *False*

*The Elevation Certificate is mainly used by the insurance company to rate the building for flood insurance.*

# Question 2

*The elevation data recorded in Section C must be certified by a surveyor, engineer, or architect (as allowed by state law).*

___ *True*
___ *False*

# *Answer 2*

*The elevation data recorded in Section C must be certified by a surveyor, engineer, or architect (as allowed by state law).*

*_X_ True*
*___ False*

*In **NC** must be a Surveyor.*

# Question 3

*Before accepting an Elevation Certificate, a community official should carefully review all the data entries to ensure it was filled out correctly.*

___ *True*
___ *False*

# Answer 3

*Before accepting an Elevation Certificate, a community official should carefully review all the data entries to ensure it was filled out correctly.*

*_X_ True*
*___ False*

# Question 4

*If a building does not have permanent flood openings, Items A8 and A9 should be left blank.*

___ *True*
___ *False*

# Answer 4

*If a building does not have permanent flood openings, Items A8 and A9 should be left blank.*

___ *True*
_X_ *False*

*The surveyor must enter N/A*

# Question 5

*Always use the outside grade when determining the bottom of the vent is within the 1 foot*

___ *True*
___ *False*

# Answer 5

*Always use the outside grade when determining the bottom of the vent is within the 1 foot*

__ True
_X_ False

Items A8.b–d Enter in Item A8.b the number of permanent flood openings in the crawlspace or enclosure(s) that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. (A permanent flood

# Question 6

*A "0" for Item C2e indicates that there is no machinery or equipment servicing the building.*

___ *True*
___ *False*

# Answer 6

*A "0" for Item C2e indicates that there is no machinery or equipment servicing the building.*

___ *True*
_X_ *False*

*The Surveyor must enter N/A*

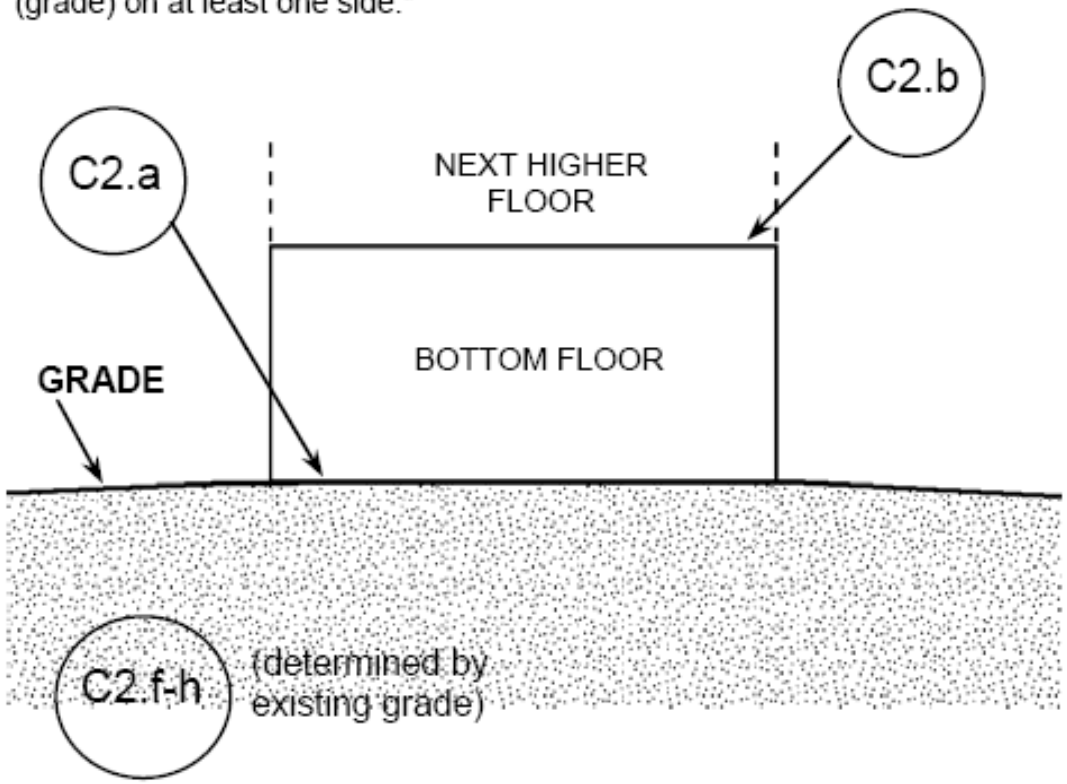
*Use comments please!*

# Building Diagram 1A

**DIAGRAM 1A**

**All slab-on-grade single- and multiple-floor buildings (other than split-level) and high-rise buildings, either detached or row type (e.g., townhouses); with or without attached garage.**

**Distinguishing Feature –** The bottom floor is at or above ground level (grade) on at least one side.*

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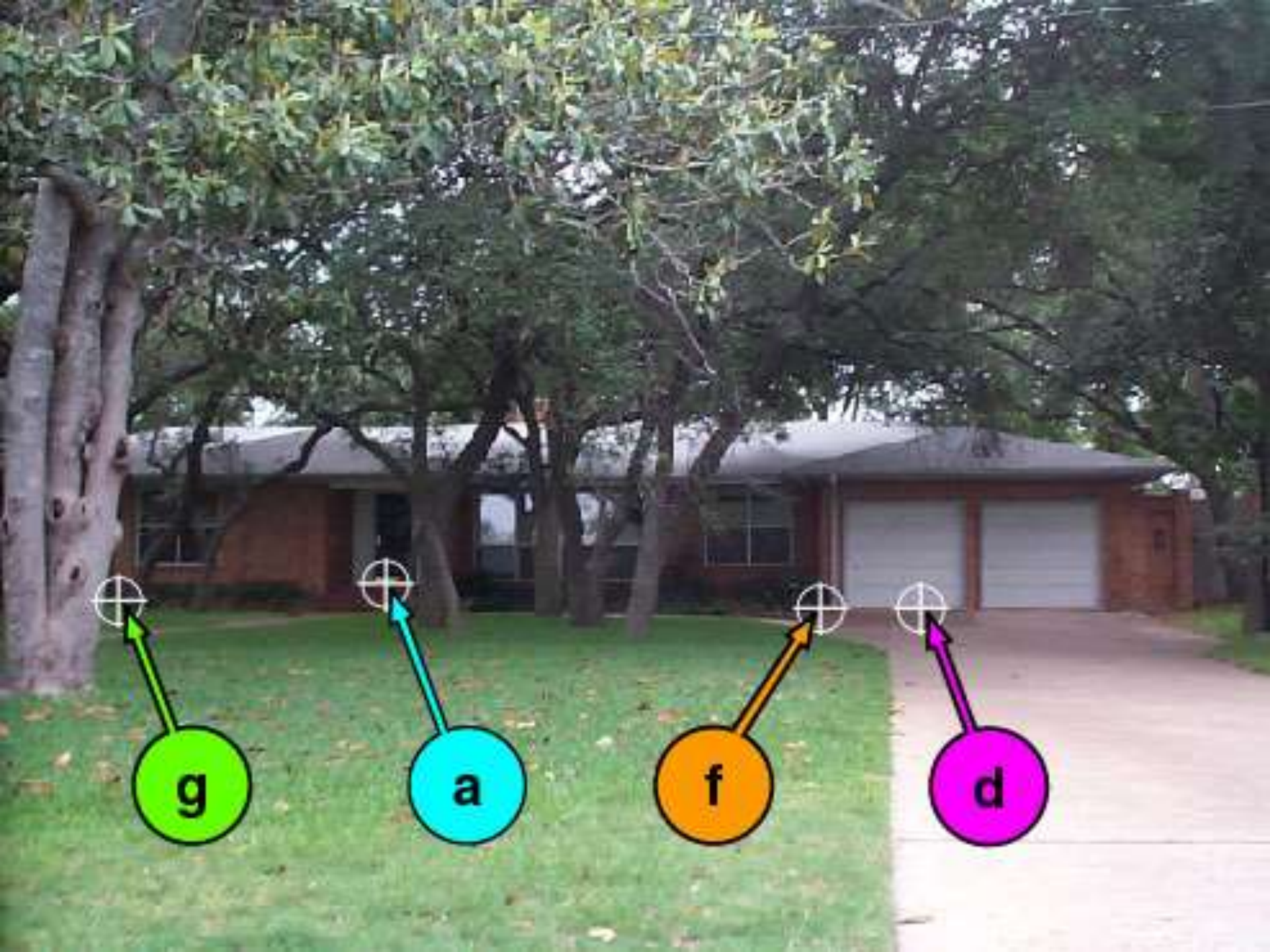
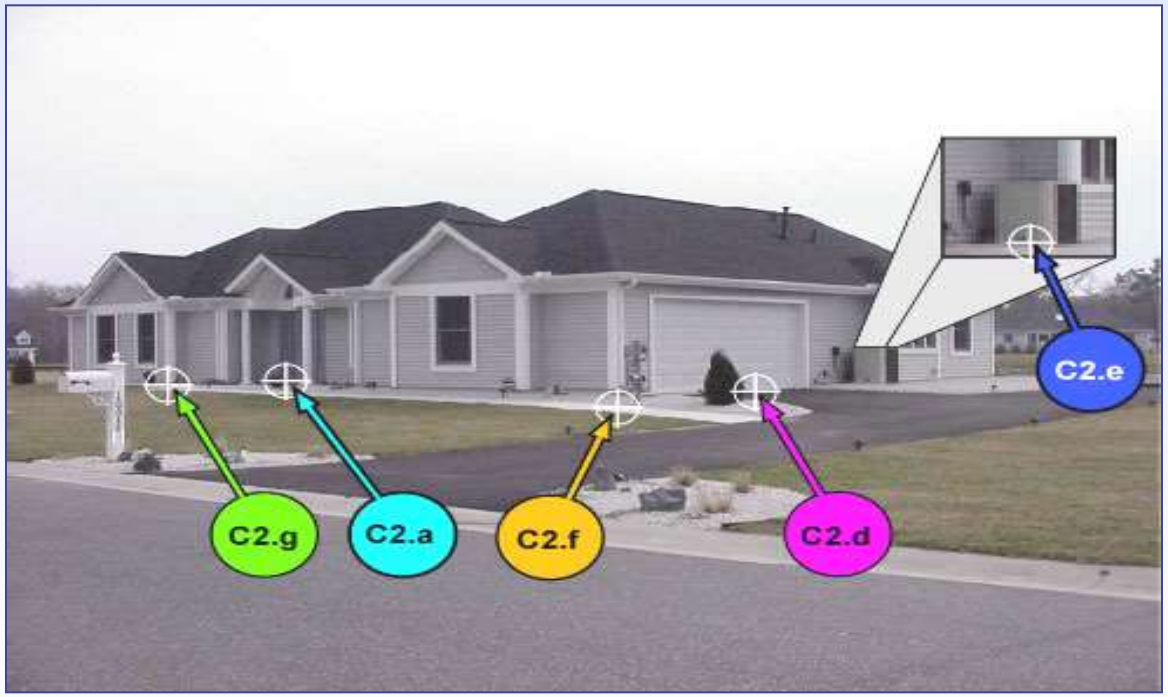

g
a
f
d

# Slab-on-grade
# one-story building with attached garage

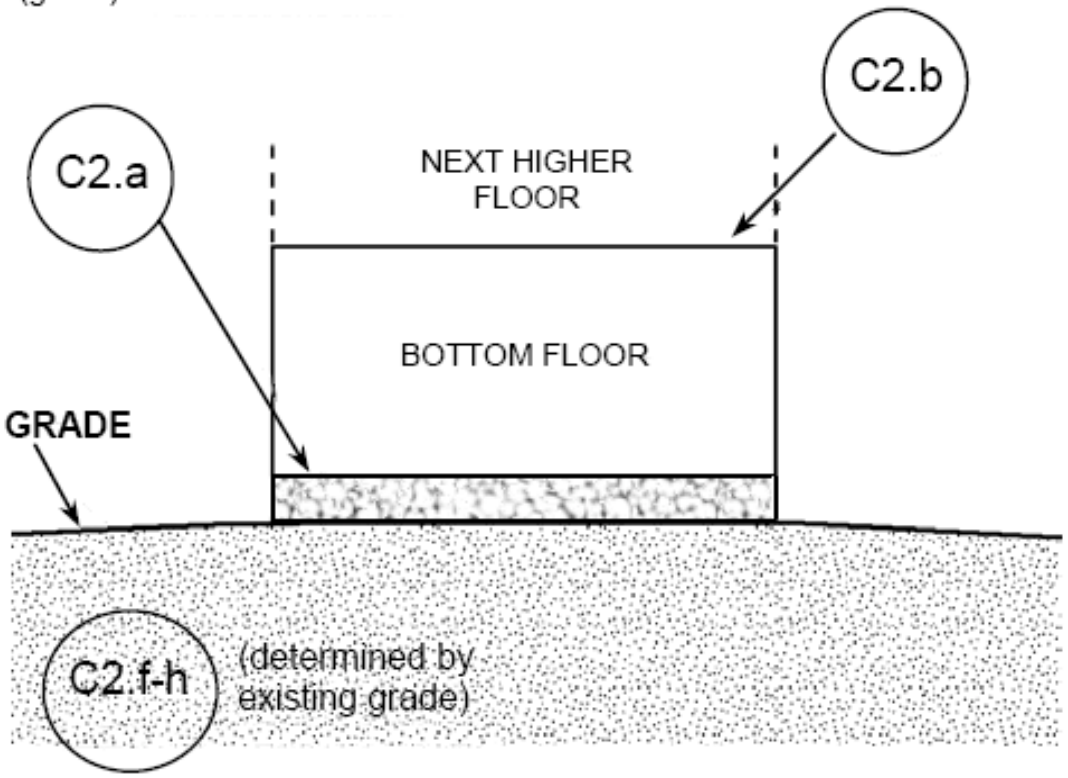


# Building Diagram 1B

**DIAGRAM 1B**

**All raised-slab-on-grade or slab-on-stem-wall-with-fill single- and multiple-floor buildings (other than split-level), either detached or row type (e.g., townhouses); with or without attached garage.**

**Distinguishing Feature –** The bottom floor is at or above ground level (grade) on at least one side.*

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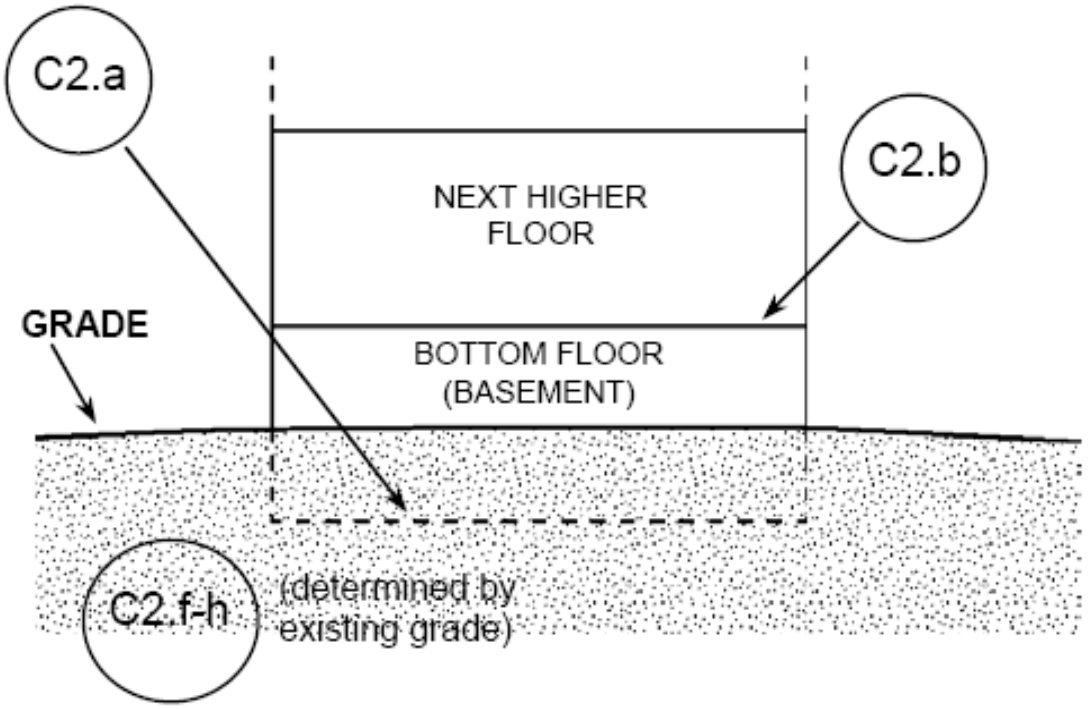
# Slab on stem wall with fill

# Building Diagram 2

**DIAGRAM 2**

**All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.**

**Distinguishing Feature –** The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*

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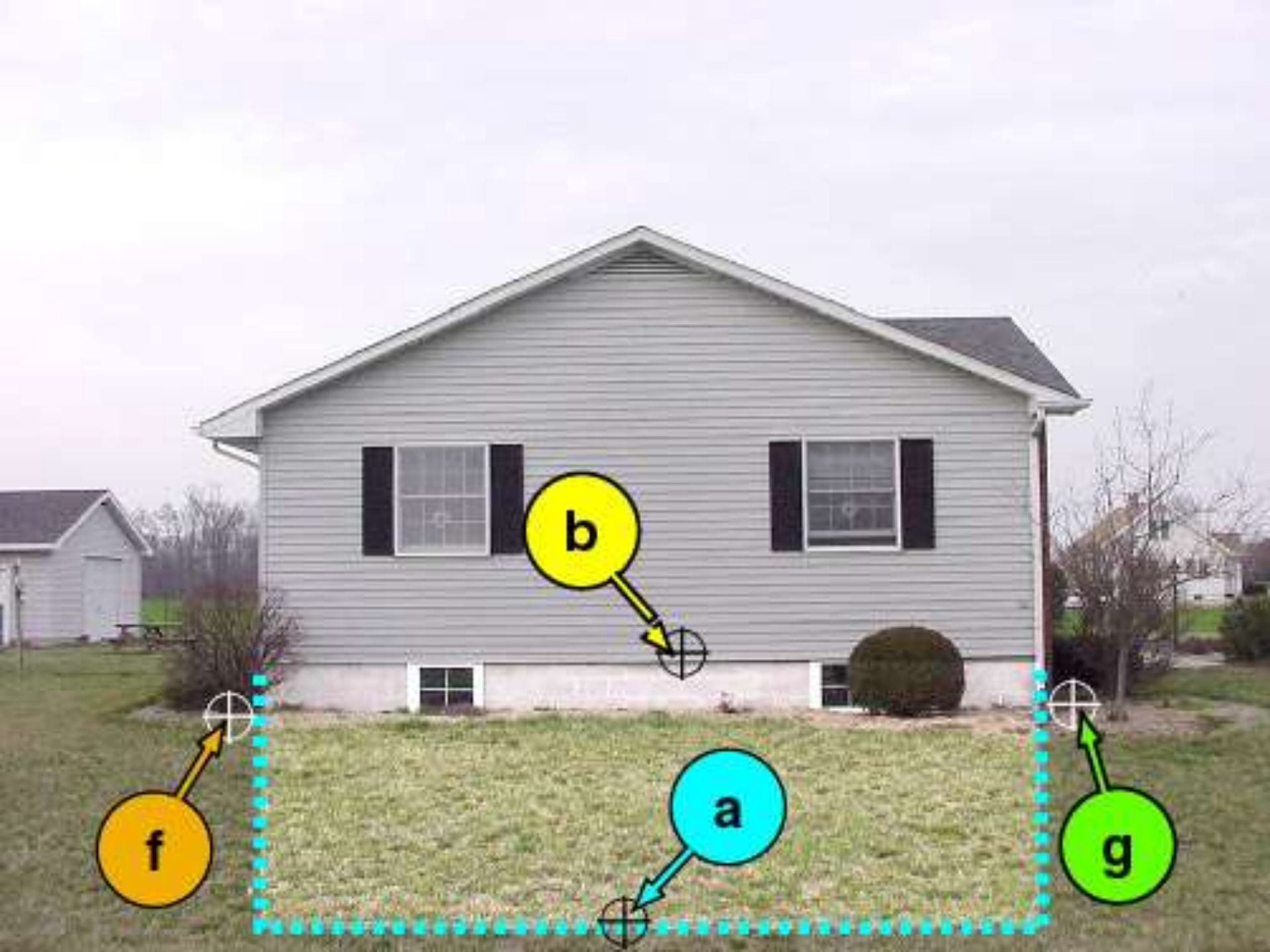

b
f
a
g

# Which Diagram Do You Use?

**Sloping sites**

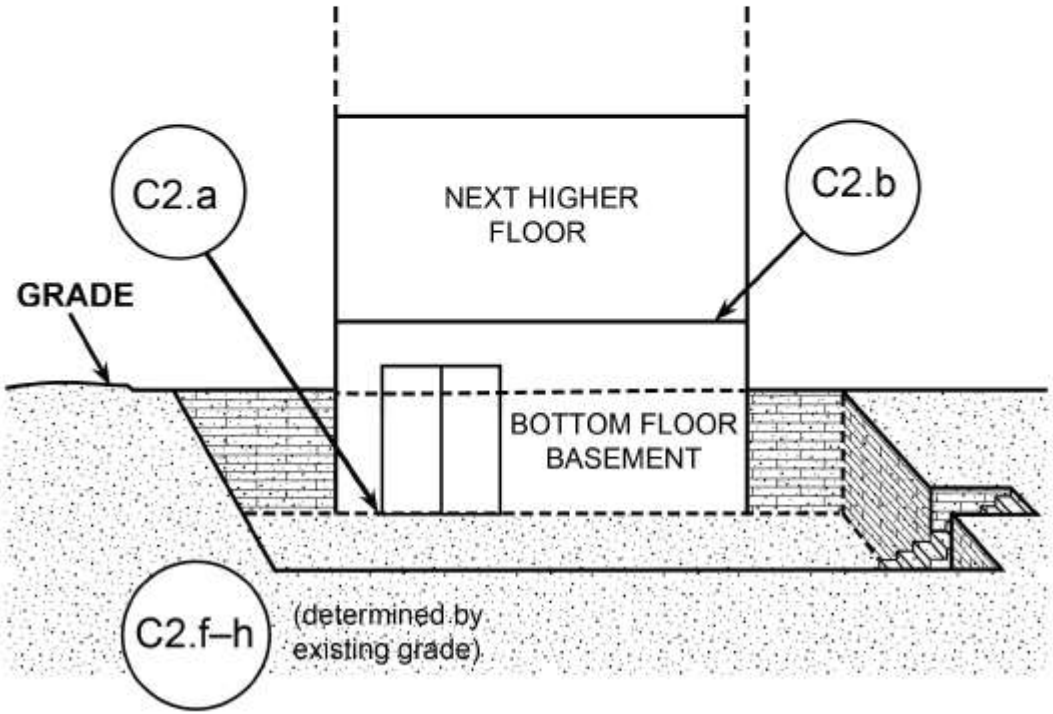
**Buildings on solid perimeter foundation walls that are set into a sloping site present another special situation with respect to installation of openings. Careful attention must be paid to the following:**

***The interior floor along the lower side of a building that is set into a sloping site must be at or above the exterior grade across the entire length of that side of the building, other- wise the enclosure becomes a basement.***

## DIAGRAM 2B

**All single-and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage).**

**Distinguishing feature** - The bottom floor (basement or under ground garage) is below ground level (grade) on all sides; most of the height of the walls are below ground level on all sides and the door and area of egress is also below ground level on all sides.*



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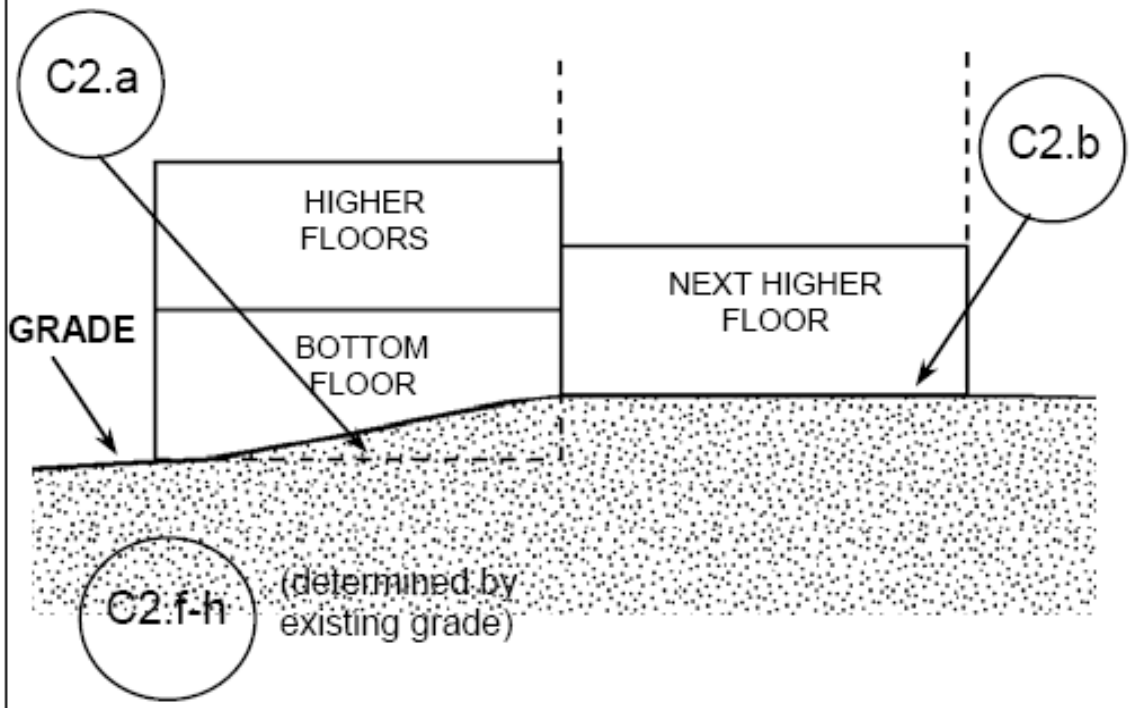
# Building Diagram 3

**DIAGRAM 3**

**All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.**

**Distinguishing Feature –** The bottom floor (excluding garage) is at or above ground level (grade) on at least one side.*

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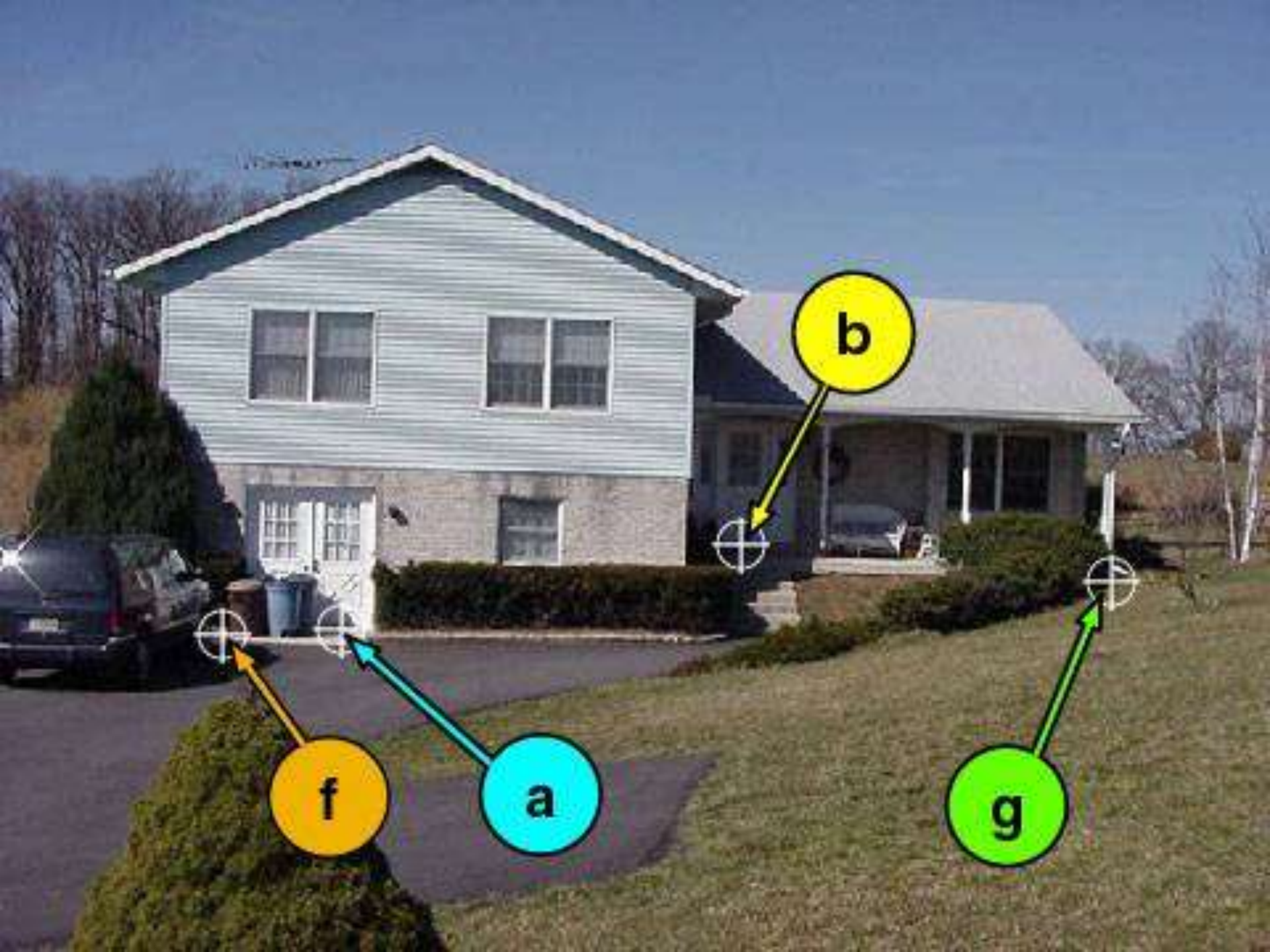
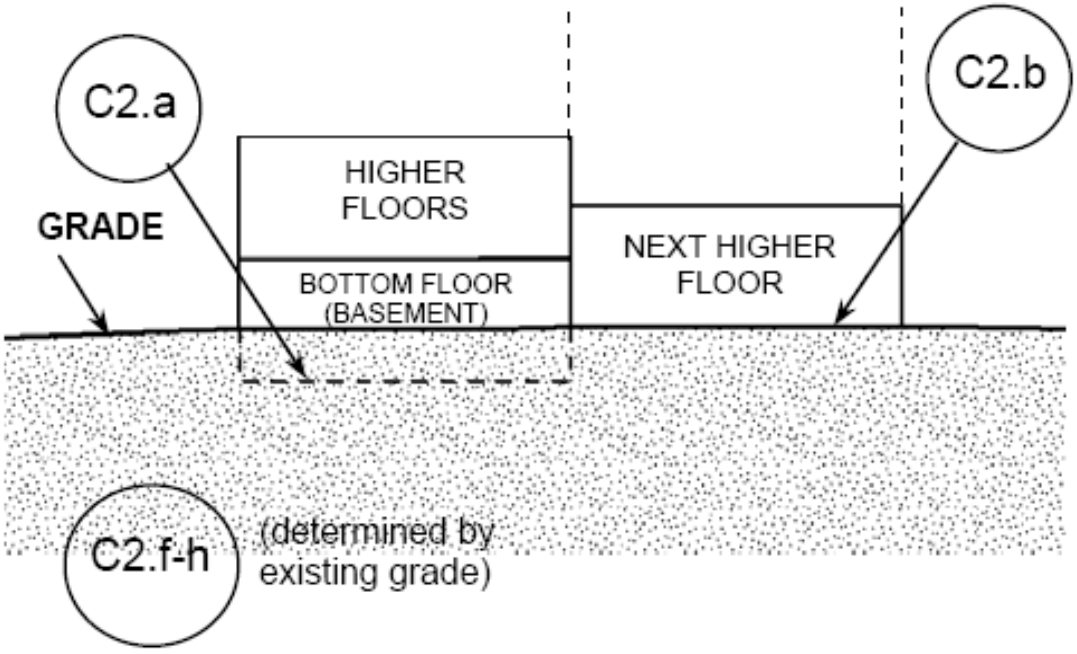

b
f
a
g

# Building Diagram 4

**DIAGRAM 4**

**All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.**

**Distinguishing Feature –** The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*

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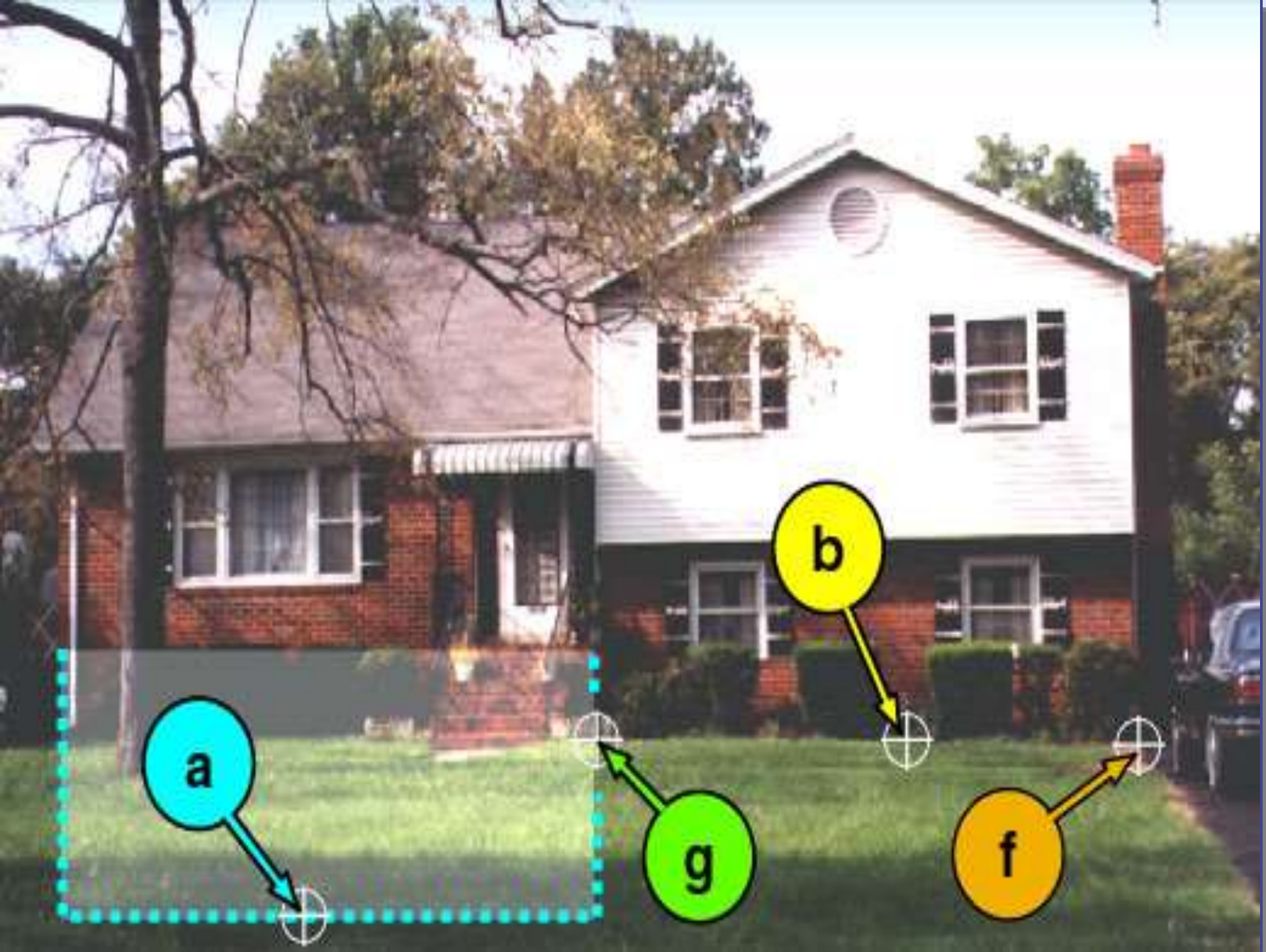
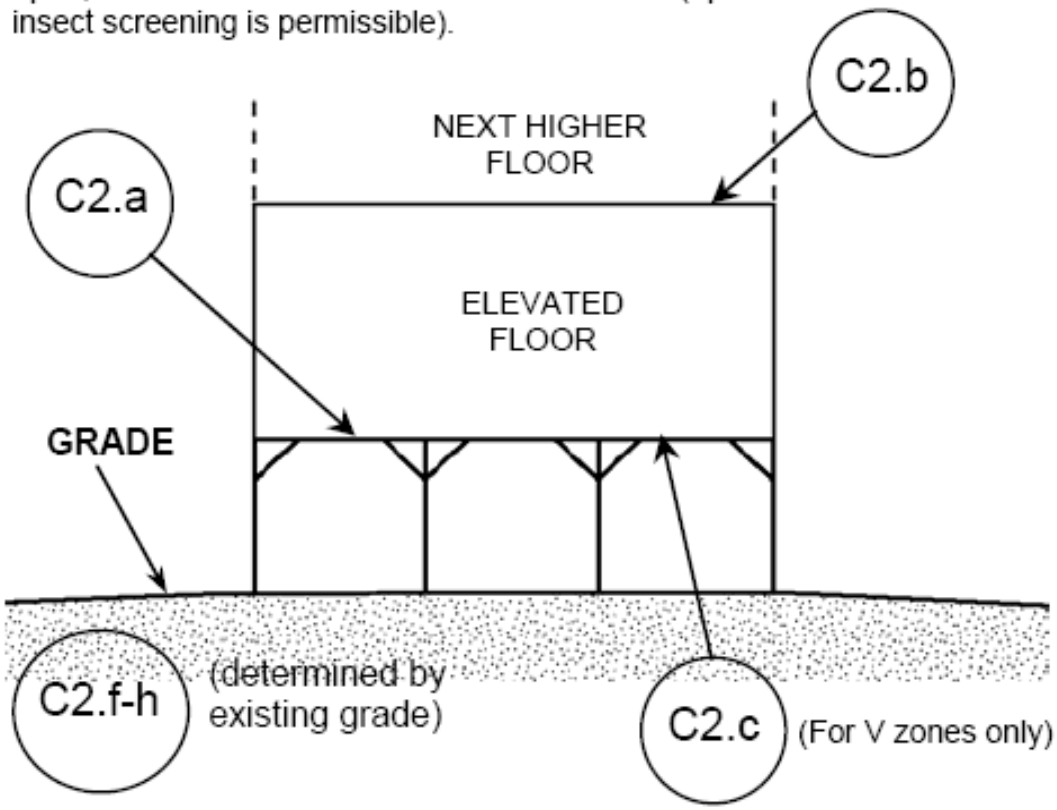

a
b
g
f

# Building Diagram 5

**DIAGRAM 5**

**All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.**

**Distinguishing Feature –** For all zones, the area below the elevated floor is open, with no obstruction to flow of flood waters (open lattice work and/or insect screening is permissible).

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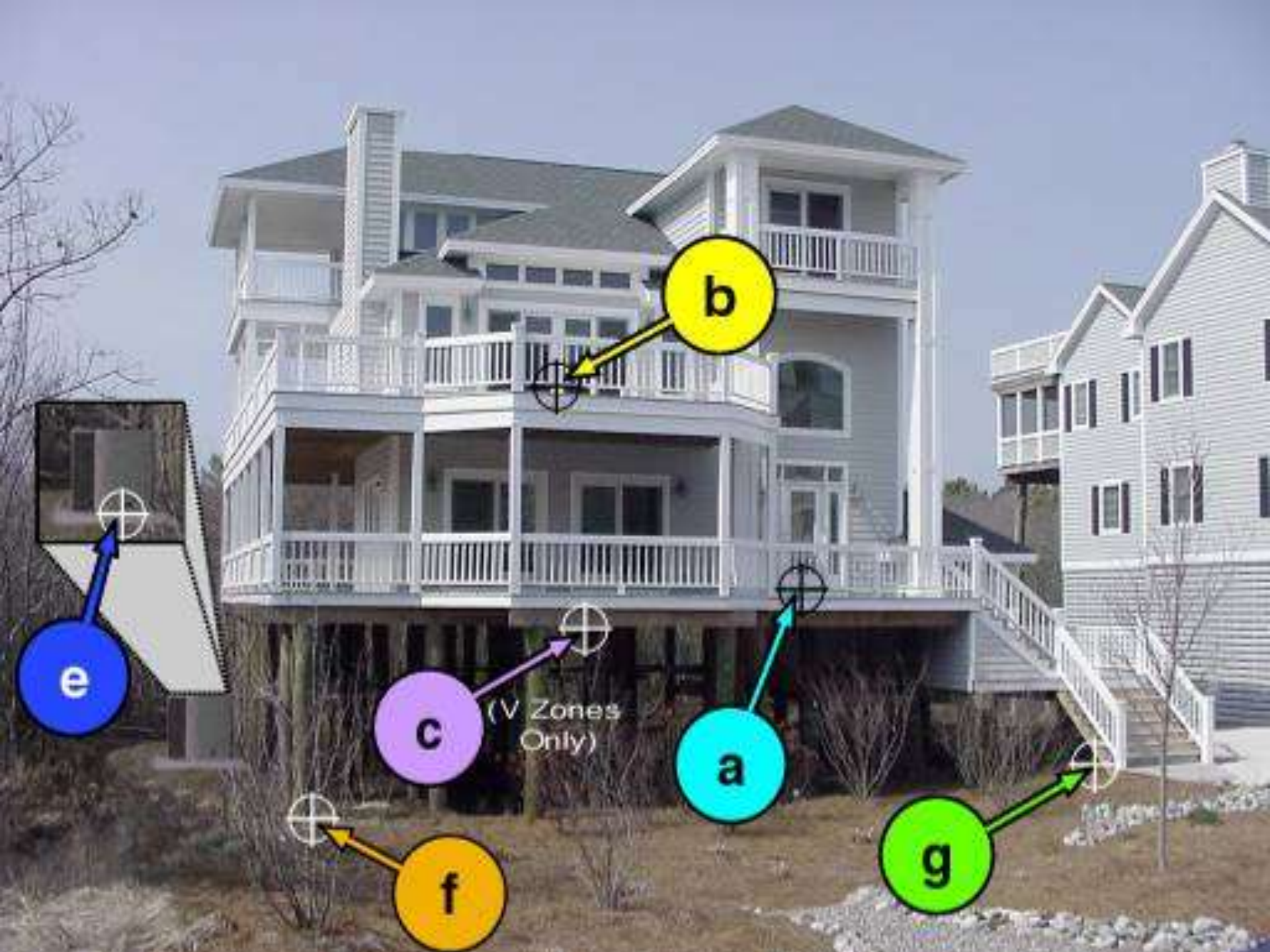
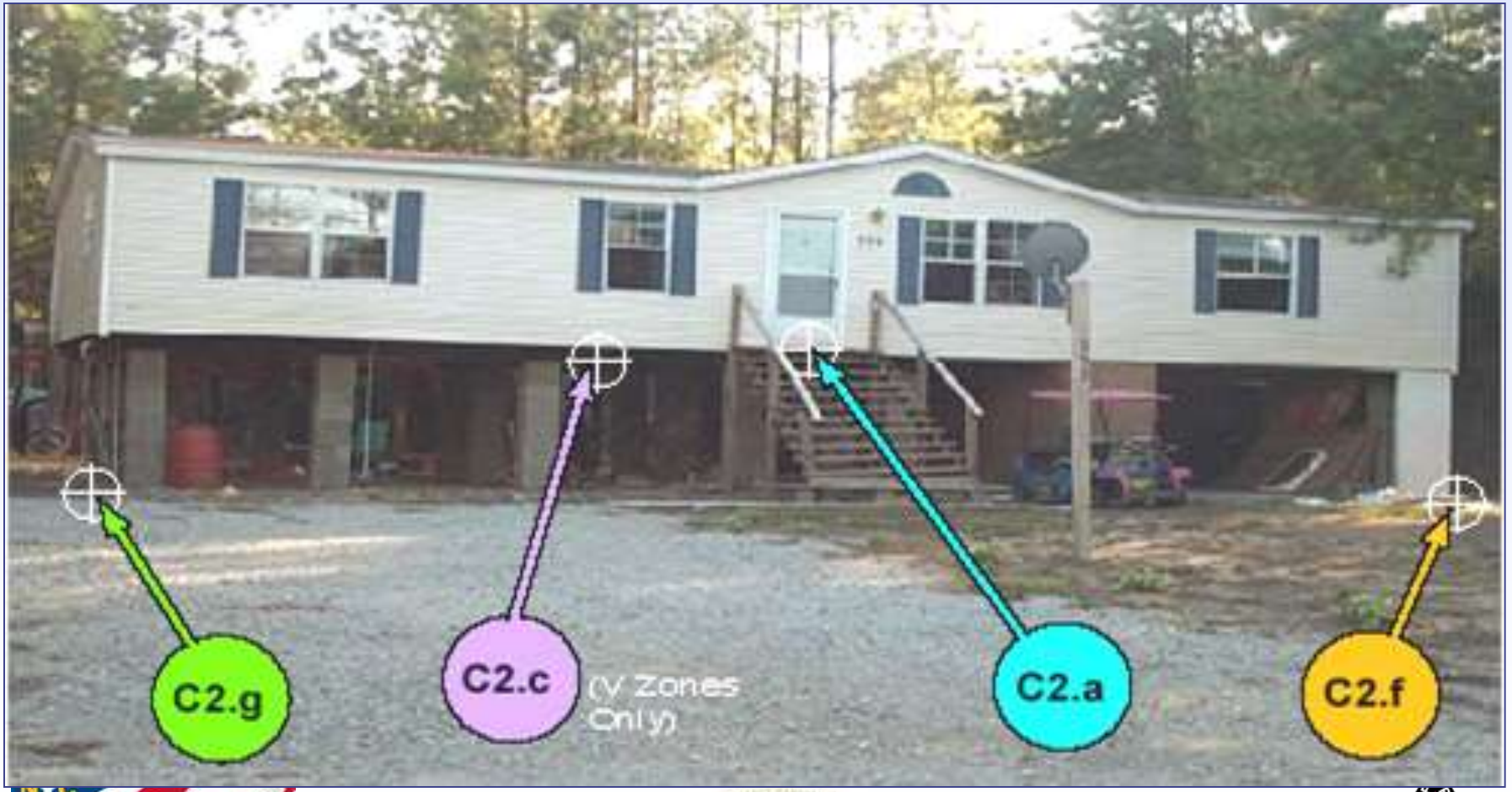

b
e
c
(V Zones
Only)
a
f
g

# Manufactured home elevated on pier foundation



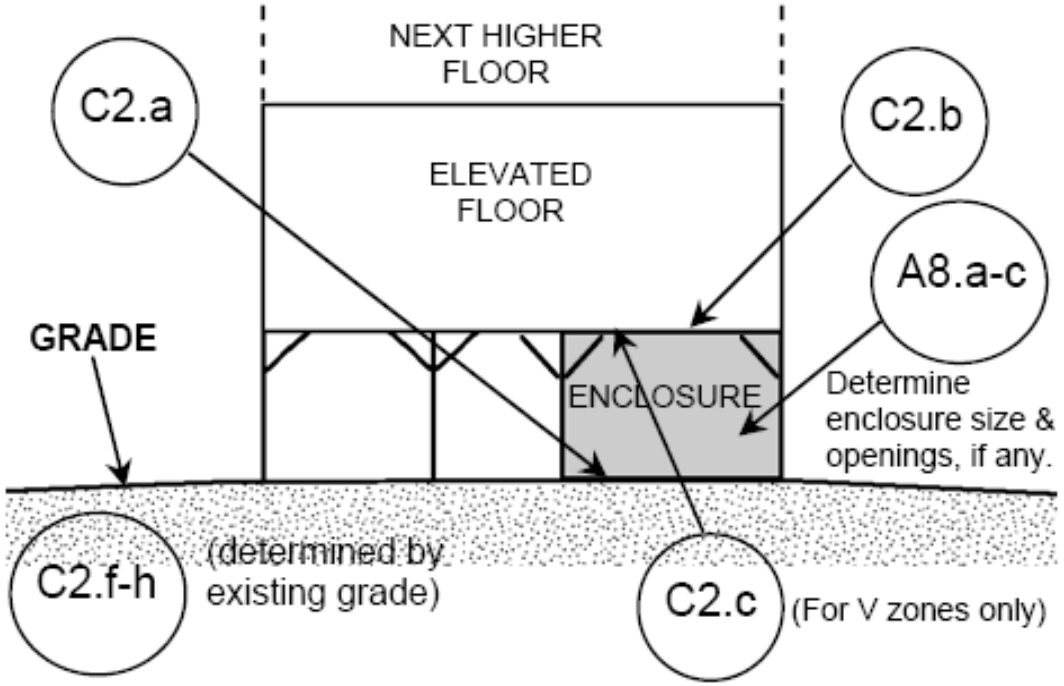
# Which Diagram is it?

# Building Diagram 6

**DIAGRAM 6**

**All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.**

**Distinguishing Feature –** For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

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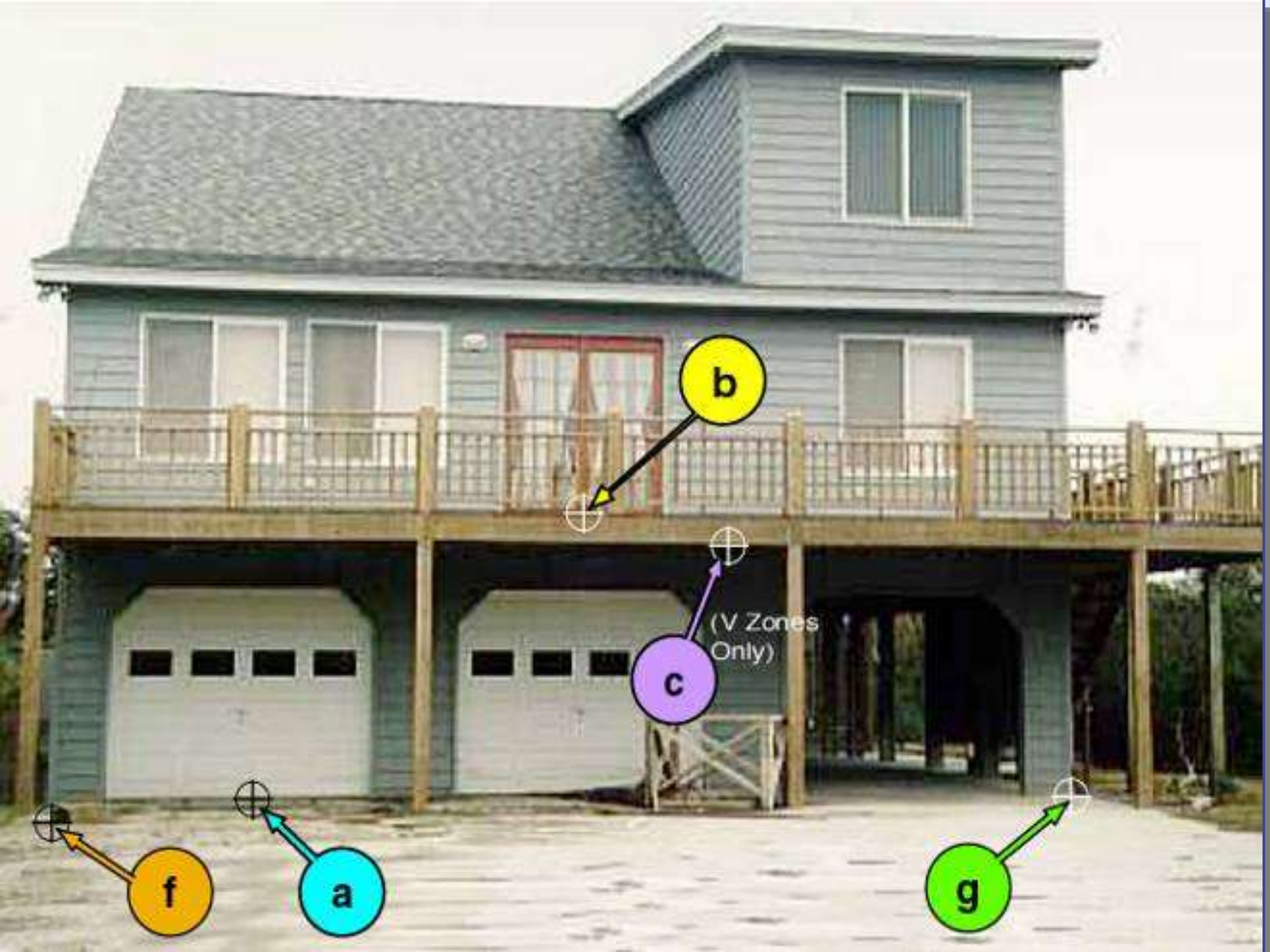
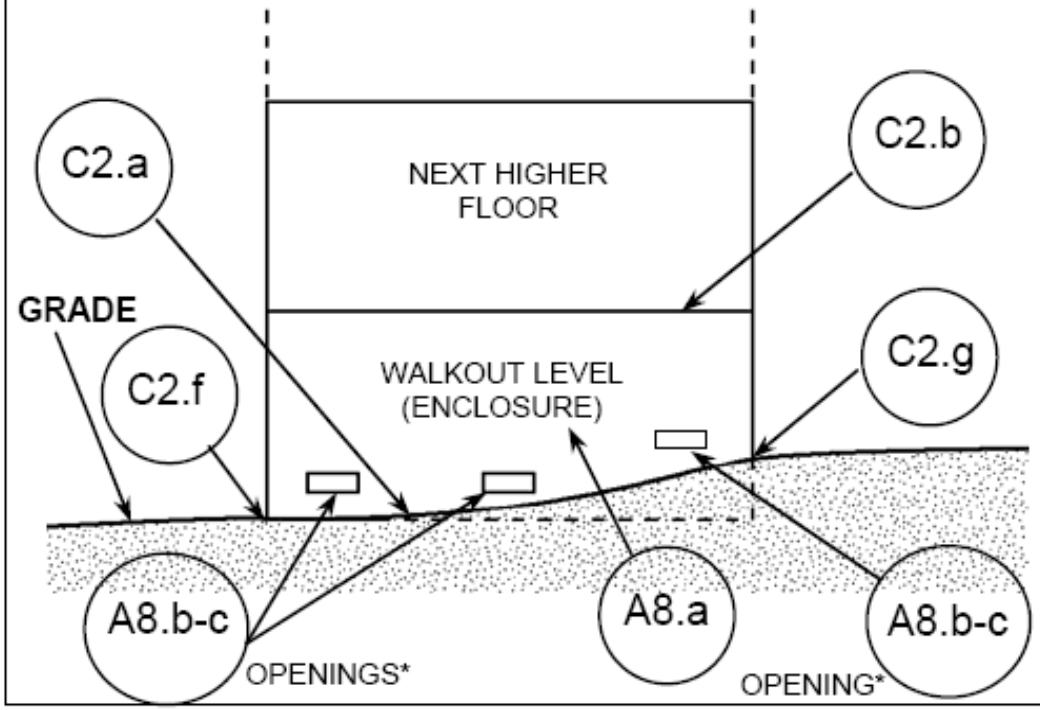

b
c
(V Zones
Only)
f
a
g

# Building Diagram 7

**DIAGRAM 7**

**All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least one side is at or above grade. The principal use of this building is located in the elevated floors of the building.**

**Distinguishing Feature –** For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

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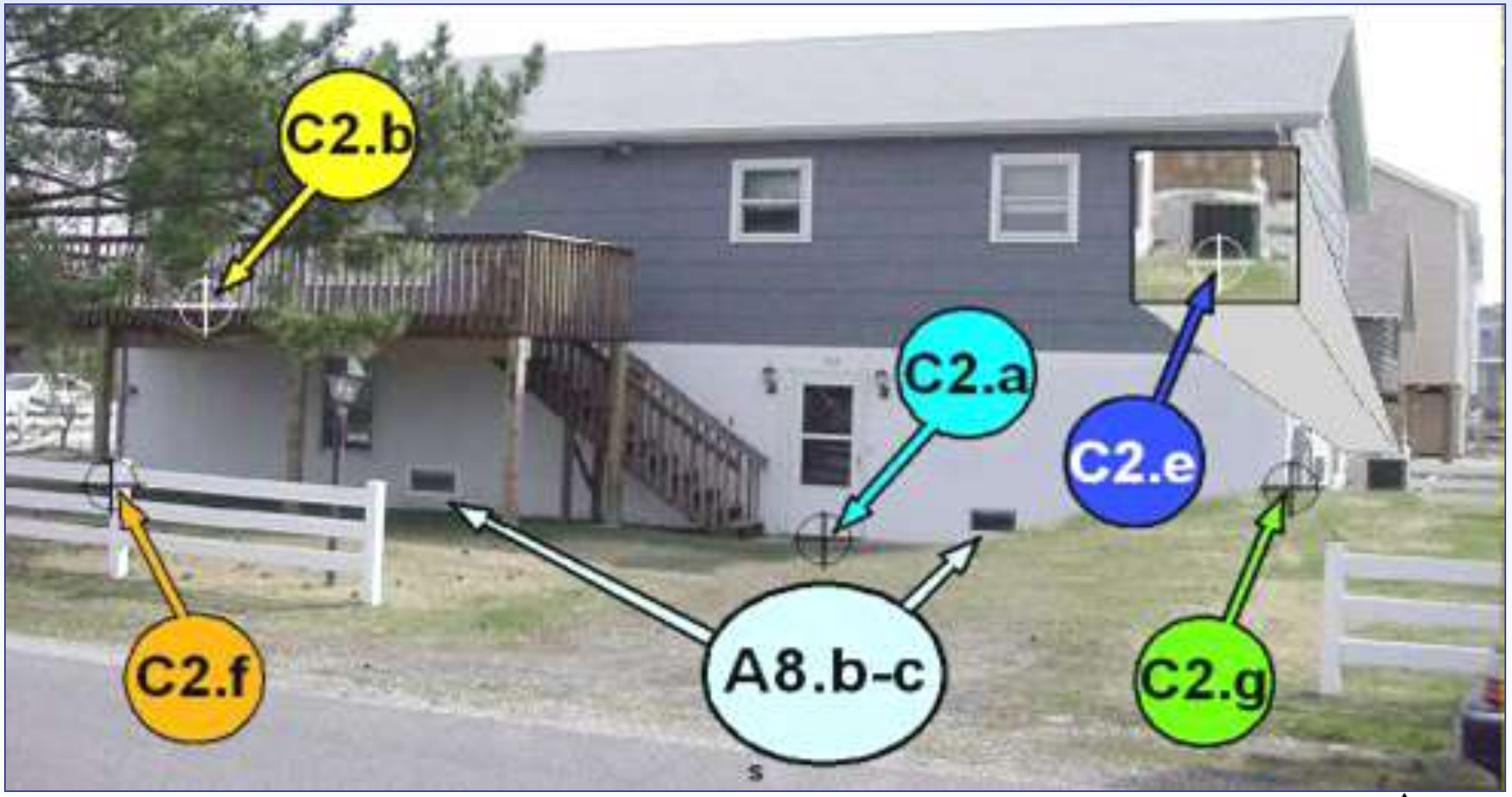
# Building elevated on full-story foundation walls

## Fully enclosed area below the elevated floor



# Building elevated on full-story foundation walls

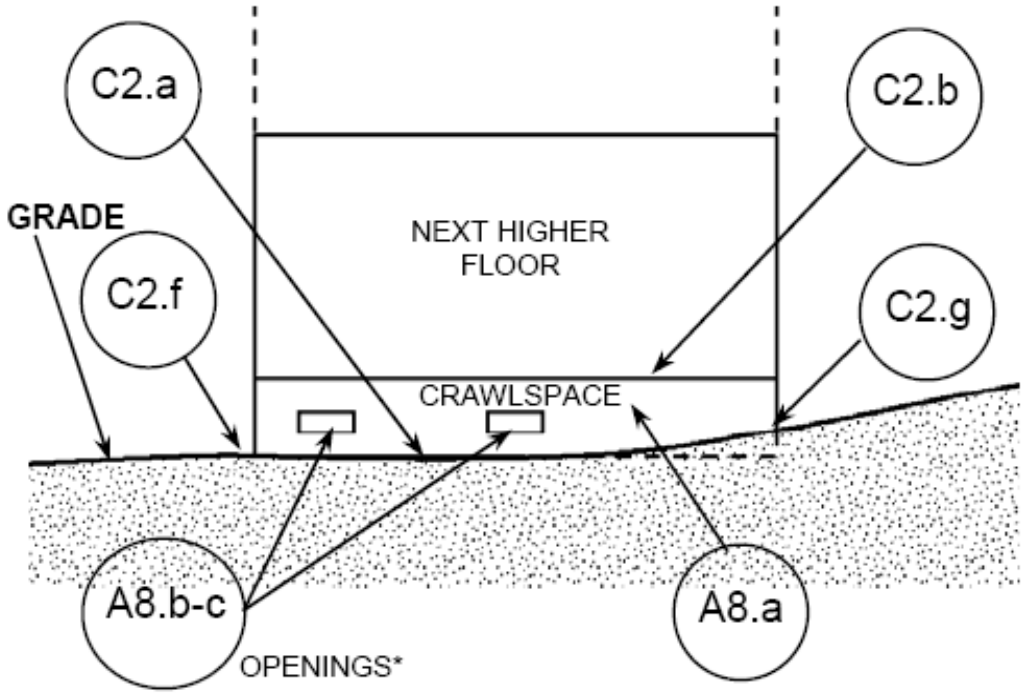
## Fully enclosed area below the elevated floor

# Building Diagram 8

**DIAGRAM 8**

**All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least one side, with or without an attached garage.**

**Distinguishing Feature –** For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings* present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property Information.

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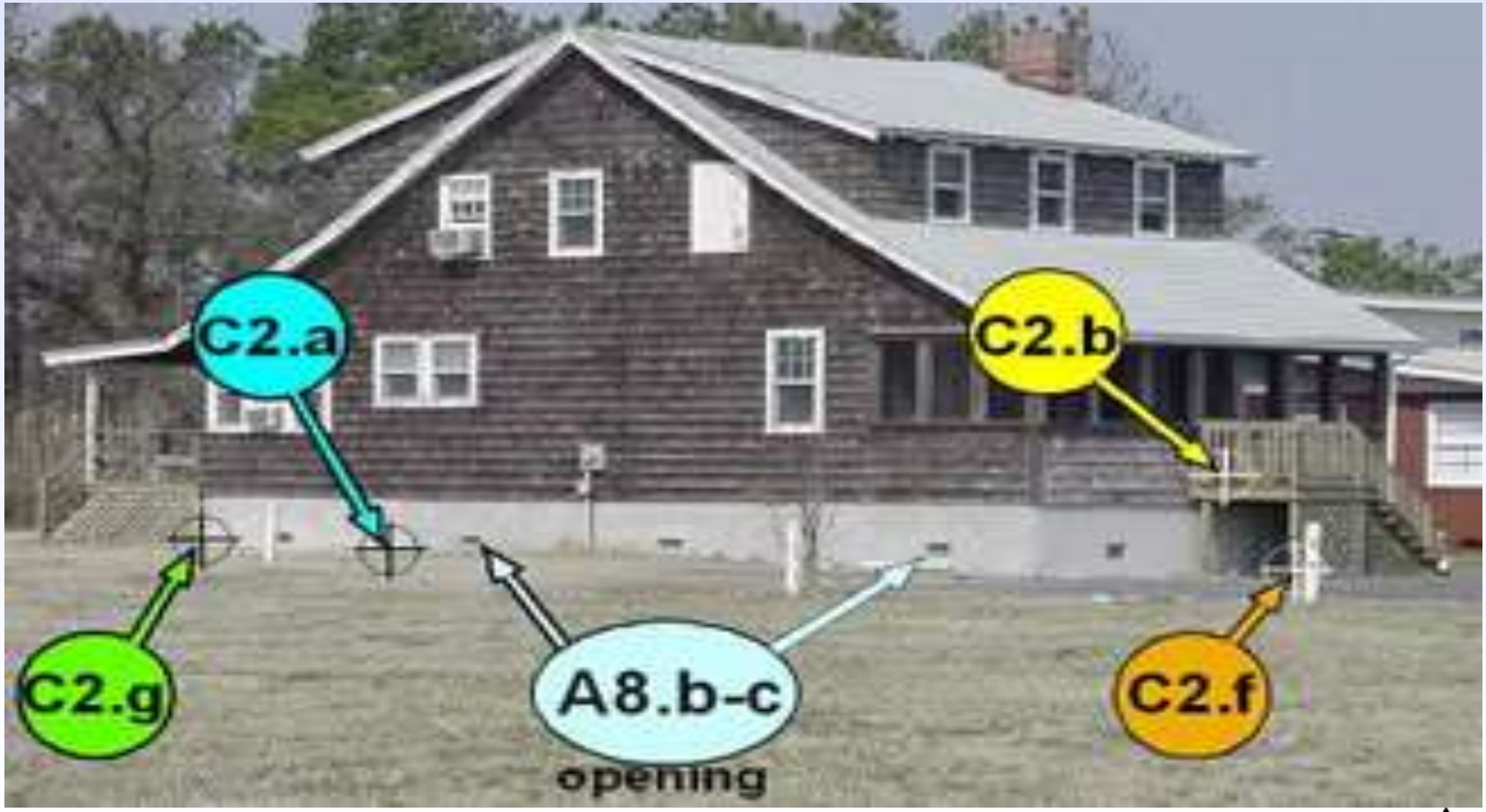
# Multi-level building elevated on crawl space

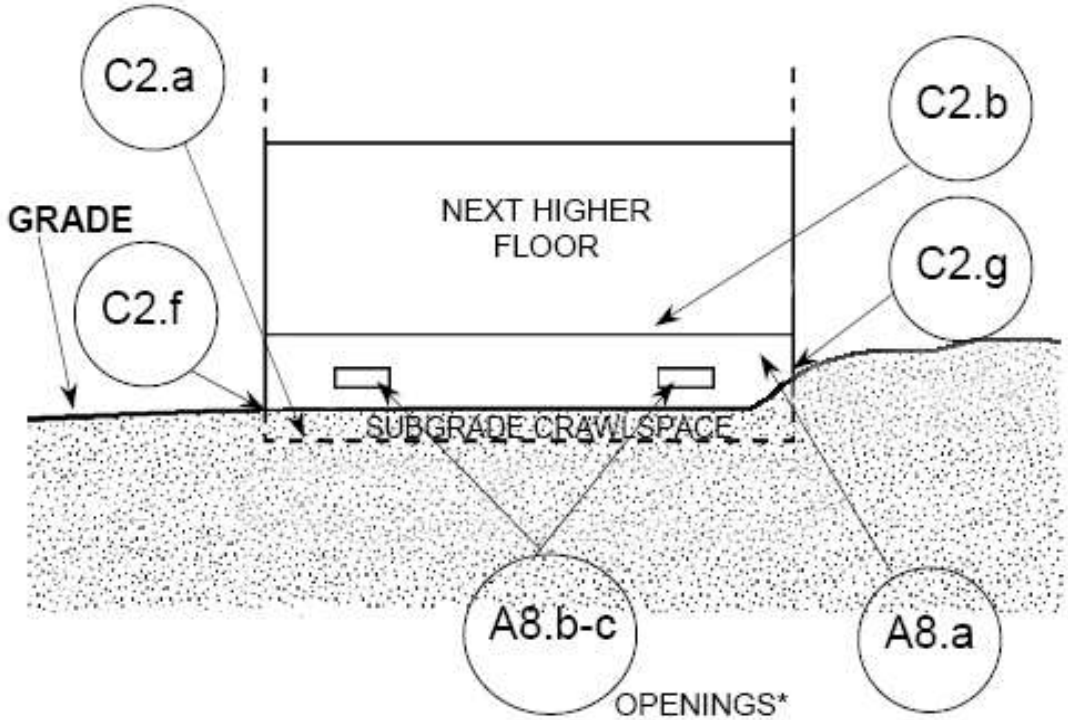


# Building Diagram 9

**DIAGRAM 9**

**All buildings (other than split-level) elevated on a sub-grade crawlspace, with or without attached garage.**

**Distinguishing Feature –** The bottom (crawlspace) floor is at or below ground level (grade) on all sides.** (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, or the crawlspace floor is more than 2 feet below the grade (LAG) on all sides, use Diagram 2.)

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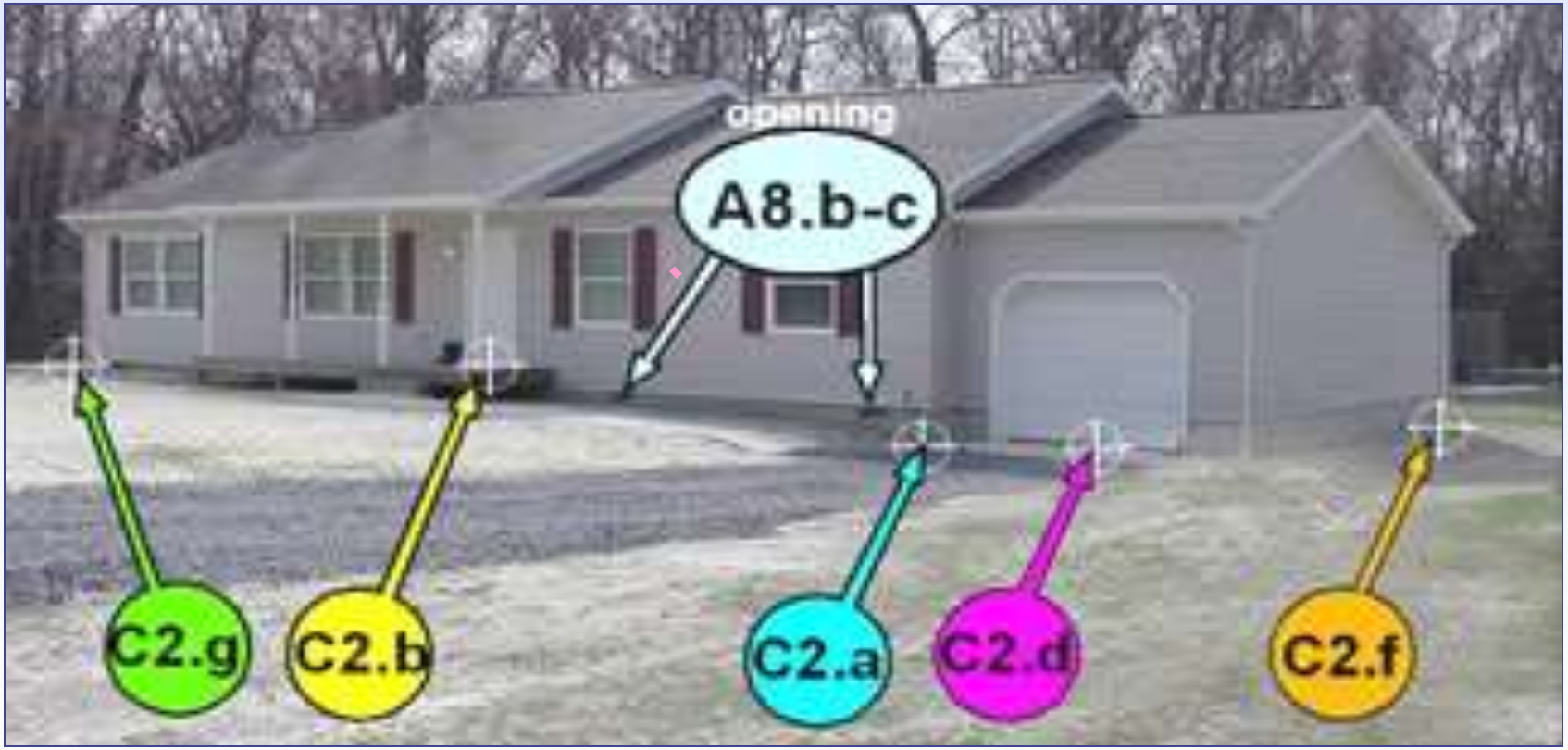
# One-story building on crawl space
## Attached garage



# Which Diagram Do You Use?

# Which Diagram Do You Use?

#2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North C

# Which Diagram Do You Use?

# Which Diagram Do You Use?

#3


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# Which Diagram Do You Use?

#4


N★C DPS
DEPARTMENT OF PUBLIC SAFETY

Emergency Management

# Which Diagram Do you Use?

# Which Diagram Do You Use?

#5


N★C DPS
DEPARTMENT OF PUBLIC S

# Which Diagram is it?

# Which Diagram Do You Use?

*#6*


N★C DPS
DEPARTMENT OF PUBLIC SA

# Which Diagram Do You Use?

#7


← *Enclosure*

# Which Diagram Do You Use?

# Which Diagram Do You Use?

#8

# Which Diagram Do You Use?

#9

# Contact Information


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***Federal Emergency Management Agency***
*1-877-FEMA-MAP*
*http://www.fema.gov/plan/prevent/fhm/fmc_main.shtm*

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# Questions?

# Thank You!