

AGENDA

STATE BUILDING CODE TECHNICAL REVIEW BOARD

Friday, July 21, 2023 - 10:00am

Virginia Housing Center
4224 Cox Road Glen Allen, Virginia

- I. Roll Call **(TAB 1)**
- II. Approval of May 12, 2023 Minutes **(TAB 2)**
- III. Approval of Final Order **(TAB 3)**
 - In Re: Fairfax County
Appeal Nos. 22-16
- IV. Approval of Interpretation 01/2023 **(TAB 4)**
 - In Re: Greg Revels (Henrico County)
Interpretation Request No 01-23
- V. Public Comment
- VI. Interpretation Request No. 02-23 **(TAB 5)**
 - In Re: Paul Koll (Gloucester County)

The requirements for anchor bolts in masonry walls.

Question 1: Since cells is plural, does embedded not less than 7" (178mm) into grouted cells of concrete masonry units mean only the top one or two concrete masonry units or grouted down to the footing?

Question 2: If only the top one or two concrete masonry units are required to be grouted then how is the grout pour stopped at that level?

Question 3: Would grouting only one or two masonry units be adequate to prevent the house from sliding or uplift in our 115 mph wind zone?
- VII. Secretary's Report
 - a. Review Board Policy #32 **(TAB 6)**
 - b. September 22, 2023 meeting update - location VHC
 - c. Legal updates from Board Counsel

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STATE BUILDING CODE TECHNICAL REVIEW BOARD

James R. Dawson, Chair

(Virginia Fire Chiefs Association)

W. Shaun Pharr, Esq., Vice-Chair

(The Apartment and Office Building Association of Metropolitan Washington)

Vince Butler

(Virginia Home Builders Association)

J. Daniel Crigler

(Virginia Association of Plumbing-Heating-Cooling Contractors and the Virginia Chapters of the Air Conditioning Contractors of America)

Alan D. Givens

(Virginia Association of Plumbing-Heating-Cooling Contractors and the Virginia Chapters of the Air Conditioning Contractors of America)

David V. Hutchins

(Electrical Contractor)

Christina Jackson

(Commonwealth at large)

Joseph A. Kessler, III

(Associated General Contractors)

R. Jonah Margarella, AIA, NCARB, LEED AP

(American Institute of Architects Virginia)

Eric Mays

(Virginia Building and Code Officials Association)

Joanne D. Monday

(Virginia Building Owners and Managers Association)

James S. Moss

(Virginia Building and Code Officials Association)

Elizabeth C. White

(Commonwealth at large)

Aaron Zdinak, PE

(Virginia Society of Professional Engineers)

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1 **STATE BUILDING CODE TECHNICAL REVIEW BOARD**
2 **MEETING MINUTES**
3 **May 12, 2023**
4 **Virginia Housing Center**
5 **4224 Cox Road Glen Allen, Virginia 23860**
6

Members Present

Mr. James R. Dawson, Chairman
Mr. W. Shaun Pharr, Esq., Vice-Chairman
Mr. Daniel Crigler
Mr. David V. Hutchins
Mr. Joseph Kessler
Mr. Eric Mays, PE
Mr. James S. Moss
Mr. Aaron Zdinak, PE

Members Absent

Mr. Vince Butler
Mr. Alan D. Givens
Ms. Christina Jackson
Mr. R. Jonah Margarella
Ms. Joanne Monday
Ms. Elizabeth White

7
8 Call to Order The meeting of the State Building Code Technical Review Board
9 ("Review Board") was called to order at approximately 10:00 a.m. by
10 Chair Dawson.
11
12 Roll Call The roll was called by Mr. Luter and a quorum was present. Mr. Donald
13 Ferguson, legal counsel for the Review Board from the Attorney
14 General's Office, was also present.
15
16 Approval of Minutes The draft minutes of the March 17, 2023 meeting in the Review Board
17 members' agenda package were considered. Mr. Pharr moved to
18 approve the minutes as presented. The motion was seconded by Mr.
19 Zdinak and passed with Messrs. Crigler and Mays abstaining.
20
21 The draft minutes of the April 21, 2023 retreat in the Review Board
22 members' agenda package were considered. Mr. Mays moved to
23 approve the minutes as presented. The motion was seconded by Mr.
24 Crigler and passed with Mr. Zdinak abstaining.
25
26 Final Order Monica and Michael Davis: Appeal Nos. 22-18 and 22-19:
27
28 After review and consideration of the final order presented in the
29 Review Board members' agenda package, Mr. Hutchins moved to
30 approve the final order as presented. The motion was seconded by Mr.
31 Zdinak and passed with Mr. Crigler abstaining.
32
33

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34 Black Wolf Services LLC: Appeal No. 22-05:
35
36 After review and consideration of the final order presented in the
37 Review Board members’ agenda package, Mr. Zdinak moved to
38 approve the final order with the editorial change, suggested by the
39 Secretary to further clarify the decision of the Board, by adding the
40 words “because it is an occupiable space acting as a mezzanine;
41 therefore, is required to have guards and a means of egress” to the end
42 of lines 96 and 108 of the final order found on page 111 of the agenda
43 package.
44

45 The motion was seconded by Mr. Pharr and passed with Messrs.
46 Kessler and Mays abstaining.
47

48 Public Comment Chair Dawson opened the meeting for public comment. Mr. Luter
49 advised that no one had signed up to speak. With no one coming
50 forward, Chair Dawson closed the public comment period.
51

52 Chair Dawson welcomed Building Official Mark Graver, local appeals
53 board secretary Heather Baker, and local appeals board member Julian
54 Wells all from the City of Waynesboro, whose attendance to observe a
55 Review Board meeting was offered and encouraged at a recent training
56 for the City of Waynesboro provided by Secretary Luter.
57

58 New Business Fairfax County: Appeal No. 22-16:
59

60 A hearing convened with Chair Dawson serving as the presiding
61 officer. The hearing was related to the property located at 244 Old
62 Court House Road NE, in the town of Vienna in Fairfax County.
63

64 The following persons were sworn in and given an opportunity to
65 present testimony:
66

67 Austin Sanchez, Fairfax County Codes Compliance Inspector
68 Patrick V. Foltz, Fairfax County Assistant County Attorney
69

70 *Note: Barrett Kashdan, property owner, was properly notified*
71 *of the hearing. Geoffrey Kashdan, brother and Power of*
72 *Attorney for Barrett Kashdan, who provided staff with a copy*
73 *of the POA, indicated both verbally during a telephone*
74 *conversation with staff and in an email dated May 11, 2023 that*
75 *neither he nor Barrett would be attending the hearing.*
76 *Furthermore, Geoffrey waived Barrett’s right to attend/appear*
77 *and agreed to accept the decision of the Review Board.*
78

79 After testimony concluded, Chair Dawson closed the hearing and stated
80 a decision from the Review Board members would be forthcoming and

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81 the deliberations would be conducted in open session. It was further
82 noted that a final order reflecting the decision would be considered at a
83 subsequent meeting and, when approved, would be distributed to the
84 parties, and would contain a statement of further right of appeal.
85

86 Decision: Fairfax County: Appeal No. 22-16:
87

88 After deliberations, Mr. Mays moved to uphold the County and
89 overturn the local appeals board based on the evidence found on page
90 142 of the agenda package which conclusively demonstrated that a
91 carport was constructed between 1972 and 1976 without the required
92 permits. Mr. Mays further moved to uphold the County and overturn
93 the local appeals board on the removal and installation of appliances
94 without the required permits regardless of their location in the structure.
95 The motion was seconded by Mr. Crigler and passed unanimously.
96

97 Request for Interpretation of Greg Revels (Henrico County):
98 Interpretation Request No. 01-23:
99

100 An interpretation request from Greg Revels of Henrico County was
101 considered concerning the 2017 National Electrical Code (NEC)
102 Section 250.24 related to whether equipment connected via taps ahead
103 of the main for PV systems required to comply with 2017 NEC Section
104 250.24.
105

106 Mr. Hutchins moved that the answer is *“Yes. Section 705.12(A) of the*
107 *2017 NEC allows connecting PV systems to dwelling unit electric*
108 *utilities via disconnect switch on the supply side of the existing electric*
109 *service disconnecting means.”* The motion was seconded by Mr. Moss
110 with Mr. Mays abstaining.
111

112 Request for Interpretation of Paul Koll (Gloucester County):
113 Interpretation Request No. 03-23:
114

115 An interpretation request from Paul Koll of Gloucester County was
116 considered concerning the 2018 Virginia Construction Code (VCC)
117 Section R403.1.6 related to the requirements for anchor bolts in
118 masonry walls.
119

120 After a brief discussion, Mr. Mays moved to defer the matter to the July
121 21, 2023 meeting pending an informal staff opinion from the ICC on
122 VCC Section R403.1.6. The motion was seconded by Mr. Moss and
123 passed unanimously.
124

125 The Board directed the secretary to submit the request for the informal
126 staff opinion to the ICC for VCC Section R403.1.6. To ensure the
127 proper inquiry was made to ICC, Mr. Mays agreed to work with Mr.

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State Building Code Technical Review Board
May 12, 2023 Minutes - Page 4

128 Moss to craft the question to be asked and provide it to the Secretary
129 no later than May 31, 2023.

130
131 Secretary's Report Mr. Luter pointed the Review Board members to two revised options
132 for Review Board Policy #14 presented in the Review Board members'
133 agenda package, found on pages 431 and 433. After a brief discussion,
134 Mr. Pharr moved to approve the revised Policy #14, found on page 433,
135 as presented. The motion was seconded by Mr. Moss and passed
136 unanimously.

137
138 Mr. Luter informed the Review Board of the current caseload for the
139 upcoming meeting scheduled for July 21, 2023.

140
141 Mr. Luter provided the legal updates to the Board as provided to him
142 by Mr. Bell.

143
144 Adjournment There being no further business, the meeting was adjourned by proper
145 motion at approximately 1:00 p.m.

146
147
148 Approved: July 21, 2023

149
150
151 _____
152 Chair, State Building Code Technical Review Board

153
154
155 _____
156 Secretary, State Building Code Technical Review Board

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1 VIRGINIA:
2

3 BEFORE THE
4 STATE BUILDING CODE TECHNICAL REVIEW BOARD
5

6
7 IN RE: Appeal of Fairfax County
8 Appeal No. 22-16
9

10 DECISION OF THE REVIEW BOARD
11

12 I. Procedural Background
13

14 The State Building Code Technical Review Board (Review Board) is a Governor-
15 appointed board established to rule on disputes arising from application of regulations of the
16 Department of Housing and Community Development. See §§ 36-108 and 36-114 of the Code of
17 Virginia. The Review Board's proceedings are governed by the Virginia Administrative Process
18 Act (§ 2.2-4000 et seq. of the Code of Virginia).
19

20 II. Case History

21 On July 14th and 15th of 2021 the Fairfax County Department of Code Compliance
22 (County), the agency responsible for the enforcement of the 1970 Building Officials and Code
23 Administrators (BOCA) Basic Building Code, 1972 BOCA Basic Building Code Accumulative
24 Supplement, 1975 BOCA Basic Building Code, 1971 One and Two Family Dwelling Code, 1975
25 One and Two Family Dwelling Code, 1972 BOCA Mechanical Code, 1975 BOCA Mechanical
26 Code, 1975 BOCA Plumbing Code, and 2018 Virginia Uniform Statewide Building Code
27 (Virginia Construction Code or VCC), performed inspections for the residential structure, located
28 at 244 Old Court House Road NE, in the town of Vienna in Fairfax County, owned by Barrett
29 Kashdan (Kashdan). As a result of the inspections a Corrective Work Order (CWO) was issued on
30 August 3, 2021 citing violations of VCC Sections 108.1 and 113.3 related to the following:

- 31 a. Construction of a one story attached addition with a front porch, rear deck
with stairs, and an attached storage shed. The addition is comprised of a

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- 32 full kitchen, full bathroom, living area, and bedroom. The addition has no
33 access to the main dwelling and electric service is supplied by a sub panel
34 in the kitchen.
- 35 b. Replacement of the service panel. The replacement of the panel was
36 permitted under electrical permit #70120145 but never finalized and has
37 since expired.
 - 38 c. Replacement of the gas water heater and gas furnace in the main dwelling.

39 On December 7, 2021 the County confirmed the above listed issues resulting in the cited violations
40 to VCC Section 108.1 and 113.3 still existed and subsequently issued a Notice of Violation (NOV)
41 on December 8, 2021.

42 David Whitting, legal counsel at that time for Kashdan, filed an appeal to the Fairfax
43 County Board of Building Code Appeals (local appeals board) which was upheld on September
44 14, 2022. The County further appealed to the Review Board on October 4, 2022.

45 Appearing at the Review Board meeting for Fairfax County were Austin Sanchez and
46 Patrick Foltz. Barrett Kashdan was properly noticed of the hearing; however, did not attend.
47 Additionally, Geoffrey Kashdan, brother and Power of Attorney for Kashdan, who provided staff
48 with a copy of the POA, indicated both verbally during a telephone conversation with staff and in
49 an email dated May 11, 2023 that neither he nor Kashdan would be attending the hearing.
50 Furthermore, Geoffrey waived Kashdan's right to attend/appear and agreed to accept the decision
51 of the Review Board.

52 III. Findings of the Review Board

53 A. Whether to overturn the building official and uphold the local appeals board that
54 violations of VCC Sections 108.1 and 113.3 do not exist because the records associated with
55 construction, permitting, and inspections on the subject property, originally constructed in 1960
56 and then modified prior to 1988 (when the current owner purchased the property) to convert a
57 carport/garage to an enclosed living space are not available to determine the acceptability of the
58 property to the codes in effect during that period. In addition, the prior use of that living space as

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59 a separate dwelling unit, which was the basis for a complaint to the County, has been terminated.
60 In upholding the appeal, it was noted that the Notice of Violation also included the lack of a final
61 inspection and approval of an electrical panel and replacement gas furnace and water heater in the
62 subject property, which are separate issues but were combined with the enclosed living space issue.

63 The County argued that a carport was constructed between 1972 and 1976 without the
64 required permits and inspections. The County argued that no record of permits for the carport
65 exist. The County further argued that the 1970 BOCA Basic Building Code was in effect in
66 Fairfax County during that time as that code was adopted on August 4, 1971 and the Virginia
67 code amendments, as stated on the Department of Housing and Community Development
68 (DHCD) website, were adopted on April 1, 1973. The County further argued that pursuant to
69 those codes an application was required involving a fee. The County also argued that sometime
70 later the carport was converted to habitable space and interior renovations were also performed
71 to the main dwelling which created a separate dwelling unit. Lastly, the County argued that
72 Kashdan had installed an electrical panel and removed and installed new gas appliances in the
73 main dwelling without the required permits and inspections.

74 The Review Board found that a carport had been constructed between 1972 and 1976
75 without the required permits based on aerial photographs provided in the record. The Review
76 Board further found that the removal and installation of new gas appliances in the main dwelling
77 occurred without the required permits.

78 IV. Final Order

79 The appeal having been given due regard, and for the reasons set out herein, the Review
80 Board orders as follows:

81 A. Whether to overturn the building official and uphold the local appeals board that
82 violations of VCC Sections 108.1 and 113.3 do not exist because the records associated with

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89 inspection and approval of an electrical panel and replacement gas furnace and water heater in the
90 subject property, which are separate issues but were combined with the enclosed living space issue.

91 The decision of the County is upheld and the decision of the local appeals board is
92 overturned because the carport was constructed between 1972 and 1976 without the required
93 permits, proven by aerial photographs provided on page 142 of the record, and that the removal
94 and installation of gas appliances in the main dwelling occurred without the required permits.

95

96

97

Chair, State Building Code Technical Review Board

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99

100 Date entered ____ July 21, 2023 _____

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104

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty (30) days
105 from the date of service (the date you actually received this decision or the date it was mailed to
106 you, whichever occurred first) within which to appeal this decision by filing a Notice of Appeal
107 with W. Travis Luter, Sr., Secretary of the Review Board. In the event that this decision is served
108 on you by mail, three (3) days are added to that period.

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34 in the kitchen.
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59 a separate dwelling unit, which was the basis for a complaint to the County, has been terminated.
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61 inspection and approval of an electrical panel and replacement gas furnace and water heater in the
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68 (DHCD) website, were adopted on April 1, 1973. The County further argued that pursuant to
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70 later the carport was converted to habitable space and interior renovations were also performed
71 to the main dwelling which created a separate dwelling unit. Lastly, the County argued that
72 Kashdan had installed an electrical panel and removed and installed new gas appliances in the
73 main dwelling without the required permits and inspections.

74 The Review Board found that a carport had been constructed between 1972 and 1976
75 without the required permits based on aerial photographs provided in the record and **that no record**
76 **of permits exist in the county database.** The Review Board further found that **the installation of an**
77 **electrical panel and** the removal and installation of new gas appliances in the main dwelling
78 occurred without the required permits **and inspections as the permits expired and the final**
79 **inspection has not been performed.**

80 IV. Final Order

81 The appeal having been given due regard, and for the reasons set out herein, the Review
82 Board orders as follows:

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83 A. Whether to overturn the building official and uphold the local appeals board that
84 violations of VCC Sections 108.1 and 113.3 do not exist because the records associated with
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90 In upholding the appeal, it was noted that the Notice of Violation also included the lack of a final
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92 subject property, which are separate issues but were combined with the enclosed living space issue.

93 The decision of the County is upheld and the decision of the local appeals board is
94 overturned because the carport was constructed between 1972 and 1976 without the required
95 permits, proven by aerial photographs provided on page 142 of the record, and that no record of
96 permits existed in the county database and that the installation of an electrical panel and the
97 removal and installation of gas appliances in the main dwelling occurred without the required
98 permits and inspections as the permits expired and the final inspection has not been performed.

99

100

101

102

103

104 Date entered ____ July 21, 2023 _____

105

106

107

108 As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty (30) days

109 from the date of service (the date you actually received this decision or the date it was mailed to

110 you, whichever occurred first) within which to appeal this decision by filing a Notice of Appeal

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111 with W. Travis Luter, Sr., Secretary of the Review Board. In the event that this decision is served
112 on you by mail, three (3) days are added to that period.

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VIRGINIA STATE BUILDING CODE TECHNICAL REVIEW BOARD

I N T E R P R E T A T I O N

Interpretation Number: 1/2023

Code: NFPA 70 - National Electrical Code/2017

Section No: Article 250.24 (see Article attached)

QUESTION: Is equipment connected via taps ahead of the main for PV systems required to comply with 2017 National Electric Code (NEC) Section 250.24?

ANSWER: Yes. Section 705.12(A) of the 2017 NEC allows connecting PV systems to dwelling unit electric utilities via disconnect switch on the supply side of the existing electric service disconnecting means.

This Official Interpretation was issued by the State Building Code Technical Review Board at its meeting of May 12, 2022.

Chair, State Building Code Technical Review Board

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250.24 Grounding Service-Supplied Alternating-Current Systems.

(A) System Grounding Connections.

A premises wiring system supplied by a grounded ac service shall have a grounding electrode conductor connected to the grounded service conductor, at each service, in accordance with 250.24(A)(1) through (A)(5).

ENHANCED CONTENT

Expand 

(1) General.

The grounding electrode conductor connection shall be made at any accessible point from the load end of the overhead service conductors, service drop, underground service conductors, or service lateral to, including the terminal or bus to which the grounded service conductor is connected at the service disconnecting means.

*Informational Note: See definitions of **Service Conductors, Overhead**; **Service Conductors, Underground**; **Service Drop**; and **Service Lateral** in Article 100.*

ENHANCED CONTENT

Expand 

(2) Outdoor Transformer.

Where the transformer supplying the service is located outside the building, at least one additional grounding connection shall be made from the grounded service conductor to a grounding electrode, either at the transformer or elsewhere outside the building.

Exception: The additional grounding electrode conductor connection shall not be made on high-impedance grounded neutral systems. The system shall meet the requirements of 250.36.

ENHANCED CONTENT

Expand 

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(3) Dual-Fed Services.

For services that are dual fed (double ended) in a common enclosure or grouped together in separate enclosures and employing a secondary tie, a single grounding electrode conductor connection to the tie point of the grounded conductor(s) from each power source shall be permitted.

(4) Main Bonding Jumper as Wire or Busbar.

Where the main bonding jumper specified in 250.28 is a wire or busbar and is installed from the grounded conductor terminal bar or bus to the equipment grounding terminal bar or bus in the service equipment, the grounding electrode conductor shall be permitted to be connected to the equipment grounding terminal, bar, or bus to which the main bonding jumper is connected.

(5) Load-Side Grounding Connections.

A grounded conductor shall not be connected to normally non-current-carrying metal parts of equipment, to equipment grounding conductor(s), or be reconnected to ground on the load side of the service disconnecting means except as otherwise permitted in this article.

Informational Note: See 250.30 for separately derived systems, 250.32 for connections at separate buildings or structures, and 250.142 for use of the grounded circuit conductor for grounding equipment.

ENHANCED CONTENT

Expand **(B) Main Bonding Jumper.**

For a grounded system, an unspliced main bonding jumper shall be used to connect the equipment grounding conductor(s) and the service-disconnect enclosure to the grounded conductor within the enclosure for each service disconnect in accordance with 250.28.

Exception No. 1: Where more than one service disconnecting means is located in an assembly listed for use as service equipment, an unspliced main bonding jumper shall bond the grounded conductor(s) to the assembly enclosure.

Exception No. 2: Impedance grounded neutral systems shall be permitted to be connected as provided in 250.36 and 250.187.

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ENHANCED CONTENT

Expand **(C) Grounded Conductor Brought to Service Equipment.**

Where an ac system operating at 1000 volts or less is grounded at any point, the grounded conductor(s) shall be routed with the ungrounded conductors to each service disconnecting means and shall be connected to each disconnecting means grounded conductor(s) terminal or bus. A main bonding jumper shall connect the grounded conductor(s) to each service disconnecting means enclosure. The grounded conductor(s) shall be installed in accordance with 250.24(C)(1) through 250.24(C)(4).

Exception: Where two or more service disconnecting means are located in a single assembly listed for use as service equipment, it shall be permitted to connect the grounded conductor(s) to the assembly common grounded conductor(s) terminal or bus. The assembly shall include a main bonding jumper for connecting the grounded conductor(s) to the assembly enclosure.

ENHANCED CONTENT

Expand **(1) Sizing for a Single Raceway or Cable.**

The grounded conductor shall not be smaller than specified in Table 250.102(C)(1).

(2) Parallel Conductors in Two or More Raceways or Cables.

If the ungrounded service-entrance conductors are installed in parallel in two or more raceways or cables, the grounded conductor shall also be installed in parallel. The size of the grounded conductor in each raceway or cable shall be based on the total circular mil area of the parallel ungrounded conductors in the raceway or cable, as indicated in 250.24(C)(1), but not smaller than 1/0 AWG.

Informational Note: See 310.10(H) for grounded conductors connected in parallel.

(3) Delta-Connected Service.

The grounded conductor of a 3-phase, 3-wire delta service shall have an ampacity not less than that of the ungrounded conductors.

(4) High Impedance.

(Page left blank intentionally)

The grounded conductor on a high-impedance grounded neutral system shall be grounded in accordance with 250.36.

(D) Grounding Electrode Conductor.

A grounding electrode conductor shall be used to connect the equipment grounding conductors, the service-equipment enclosures, and, where the system is grounded, the grounded service conductor to the grounding electrode(s) required by Part III of this article. This conductor shall be sized in accordance with 250.66.

High-impedance grounded neutral system connections shall be made as covered in 250.36.

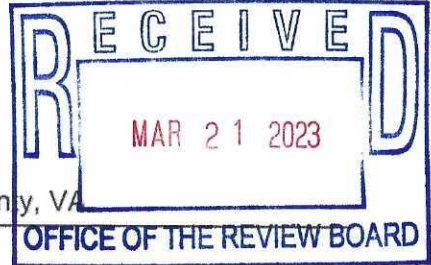
(E) Ungrounded System Grounding Connections.

A premises wiring system that is supplied by an ac service that is ungrounded shall have, at each service, a grounding electrode conductor connected to the grounding electrode(s) required by Part III of this article. The grounding electrode conductor shall be connected to a metal enclosure of the service conductors at any accessible point from the load end of the overhead service conductors, service drop, underground service conductors, or service lateral to the service disconnecting means.

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REQUEST FOR INTERPRETATION

TO: OFFICE OF THE STATE BUILDING CODE TECHNICAL REVIEW BOARD
VIRGINIA DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT
Main Street Centre
600 E. Main Street, Suite 300
Richmond, Virginia 23219-1321
Tel: (804) 371-7150 Fax: (804) 371-7092
Email: sbco@dhcd.virginia.gov



From: Paul F. Koll, CBO, MCP, Building Official, Gloucester County, VA

Phone Number : 804-693-2744

Email Address: pkoll@gloucesterva.info

Applicable Code: Virginia Residential Code (VRC)

Code Section(s): R403.1.6 Foundation anchorage

Submitted by (signature):

Date: 3-21-2023

QUESTION(S):

Section R403.1.6 in part states:

"Wood foundation plates or sills shall be bolted or anchored to the foundation with not less than 1/2-inch diameter (12.7 mm) steel bolts or approved anchors spaced to provide equivalent anchorage as the steel bolts. Bolts shall be embedded not less than 7 inches (178 mm) into concrete or grouted cells of concrete masonry units."

Questions:

1. Since cells is plural, does embedded not less than 7 inches (178 mm) into grouted cells of concrete masonry units mean only the top one or two concrete masonry units or grouted down to the footing? It has always been my opinion and practice that the masonry unit cells be grouted to the footing where anchor bolts are located.
2. If only the top one or two concrete masonry units are required to be grouted than how is the grout pour stopped at that level? The old practice of stuffing a concrete bag in the cells or filling the cells with rubble, etc.
3. Would grouting only one or two masonry units cells be adequate to prevent the house from sliding or uplift in our 115 mph wind zone?

This code language appears to be somewhat ambiguous. Especially if it can be interpreted a variety of ways. I would suggest considering clarifying the code language to be definitive.

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*County of Gloucester
Building Inspections Department
Building Two
6489 Main St., Suite 247
Gloucester, Virginia 23061
Phone: 804 693-2744 Fax: 804 824-2440*

RESOLUTION

March 15, 2023

At the meeting of the Gloucester County Local Board of Building Code Appeals located in the County of Gloucester Building Two, 2nd Floor Conference Rm., at 6489 Main Street on March 15, 2023, there were present:

Stephen B. Smith, Chairman
Carlton Hogge, Vice Chairman
Bernard Ambrose
James L. Miller, Jr.
Carl H. Hobbs III
Roberta Lane
Willard Grant
Paul F. Koll, Building Official
Bill Riter, Deputy Building Official
Heather Burch, Staff Liaison
Kim Beatley, Civil Engineer II for Gloucester County
Tim Bauer, Applicant/Contractor: Cutting Edge Builders of VA LLC
Marion Bauer, Co-Owner of Cutting Edge Builders of VA LLC
Carl Roy, Work Partner of Cutting Edge Builders of VA LLC

RE: Appeals case 23020204 Cutting Edge Builders of VA LLC

An application for appeal was submitted to the Gloucester County Board of Building Code Appeals by Marion Bauer of Cutting Edge Builders of VA LLC to appeal the Building Official's interpretation that anchor bolts are required to be placed 7 inches in grouted cells of concrete masonry units. The Building Official interpreted grouted cells to mean grouted to the footing not just the top one or two courses of masonry block. The properties are located at 7701 Cunningham Lane & 8144 Robins Neck Road, Gloucester, VA 23061.

The meeting was called to order by Chairman, Stephen Smith; roll was called, quorum present.

Mr. Koll went over the appeal application and the Contractor Tim Bauer spoke regarding his disagreement with the Building Official's interpretation of the code. Board members & county Engineer discussed grouting to the footer.

After discussion by the Board, Mr. Miller made a motion to grant a modification on these (2) houses based on the Building Inspections Office receiving a signed & sealed Engineer report on both foundation inspections. The motion was seconded by Stephen Smith; Staff Liaison performed roll call vote by board members. Mr. Koll stated that he would request a formal interpretation from the state technical review board.

The Board voted as follows:

Carlton Hogge – Yes
Willard Grant – Yes
Stephen B. Smith – Yes
Bernard Ambrose – Yes
James L. Smith Jr. – Yes
Roberta Lane – Yes
Carl H. Hobbs III – Yes

With no further new or old business the meeting was adjourned at 7:31 PM.

BE IT FURTHER RESOLVED, that “Any person who was a party to the appeal may appeal to the State Review Board by applying to such Board within 21 calendar days upon receipt by certified mail of this resolution. Application forms are available from the Office of the State Review Board, 600 East Main Street, Richmond, Virginia 23219, (804) 371-7150.” (Section 119.8 VRC 2018)



Stephen Smith, Chairman
Gloucester County Board of Building Code Appeals

PC: Cutting Edge Builders of VA LLC, Applicant/Contractor
Board Members
Office of Building Official



*County of Gloucester
Building Inspections
Building Two
6489 Main St. Ste 247
Gloucester, Virginia 23061*

At the meeting of the **Gloucester County Board of Building Code Appeals** located in the County of Gloucester Building Two at 6489 Main Street on March 15, 2023, there were present:

Bernard Ambrose
Roberta Lane
Willard Grant
Carl Hobbs III
Carlton Hogge Vice-Chair
James Miller
Stephen Smith, Chair
Paul Koll, Building Official
Bill Riter, Deputy Building Official
Heather Burch, Staff Liaison
Kim Beatley, Civil Engineer II for Gloucester County

Organizational Meeting

I. Meeting was called to order and roll was called.

II. Election of Officers

Board discussed annual election of officers. All members were in favor of them remaining as Stephen Smith as Chair and Carlton Hogge as Vice-Chair.

III. New Business

No new business discussed; agenda was read for appeal case.
Disagreement on interpretation of the code was discussed.
Board members discussed grouting down to the footer.
After discussion by the Board, Mr. Miller made a motion to grant a modification on these (2) houses based on the Building Inspections Office receiving a signed & sealed Engineer report on both foundation inspections. The motion was seconded by Stephen Smith; Staff Liaison performed roll call vote by board members. Mr. Koll stated that he would request a formal interpretation from the state technical review board.

IV. Adjournment

Meeting was adjourned at 7:31 PM.

Stephen Smith, Chair
Gloucester County Board of Building Code Appeals

*Building Two
6489 Main Street*

"Land of the Life Worth Living"

*(804) 693-2744
(804) 824-2440*

CHAPTER 4 FOUNDATIONS

R403.1.6 Foundation anchorage.

Wood sill plates and wood walls supported directly on continuous foundations shall be anchored to the foundation in accordance with this section.

Cold-formed steel framing shall be anchored directly to the foundation or fastened to wood sill plates in accordance with Section R505.3.1 or R603.3.1, as applicable. Wood sill plates supporting cold-formed steel framing shall be anchored to the foundation in accordance with this section.

Wood foundation plates or sills shall be bolted or anchored to the foundation with not less than $\frac{1}{2}$ -inch diameter (12.7 mm) steel bolts or *approved* anchors spaced to provide equivalent anchorage as the steel bolts. Bolts shall be embedded not less than 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. The centerline of the bolts shall be located a minimum of 1.75 inches (44.5 mm) from the edge of the sill plate. Bolts shall be spaced not more than 6 feet (1829 mm) on center and there shall be not less than two bolts or anchor straps per piece with one bolt or anchor strap located not more than 12 inches (305 mm) or less than 4 inches (102 mm) from each end of each piece. A properly sized nut and washer shall be tightened on each bolt to the plate. Interior bearing wall sole plates on monolithic slab foundation that are not part of a *braced wall panel* shall be positively anchored with *approved* fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Sections R317 and R318.

Exceptions:

1. Walls 24 inches (610 mm) total length or shorter connecting *offset braced wall panels* shall be anchored to the foundation with no fewer than one anchor bolt located in the center third of the plate section and shall be attached to adjacent braced wall panels at corners as shown in Item 9 of Table R602.3(1).
2. Connection of walls 12 inches (305 mm) total length or shorter connecting *offset braced wall panels* to the foundation without anchor bolts shall be permitted. The wall shall be attached to adjacent *braced wall panels* at corners as shown in Item 9 of Table R602.3(1).

Documents Provided by Staff

1. ICC Staff Opinion
2. TEK 05-03A

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Begin forwarded message:

From: Sandra Hyde <jira@icc-ts.atlassian.net>

Date: May 22, 2023 at 7:52:53 PM EDT

To: [REDACTED]

Subject: ICCTO-789 anchor bolt embedment into grouted cells of concrete masonry units

Reply-To: support@icc-ts.atlassian.net

Reply above this line.

Sandra Hyde has commented on your request:

[TEK 05-03A.pdf](#) Section 403.1.6 of the 2021 IRC specifies that anchor bolts shall extend not less than 7 inches (178 mm) into concrete or grouted cells of concrete masonry units.

1) Does this only require the cell or cells needed to embed the anchor bolt to be grouted? Or would the grouting of cells need to continue down to the footings? Per Section R403.1.6, the vertical cells containing the anchor bolt must be grouted. The IRC does not state whether cells below the anchor bolt, in low seismic regions, require grouting. In high seismic regions a wall must be fully grouted.

As the IRC has no information, I looked at the National Concrete Masonry Association's (NCMA) materials. An older document, TEK 05/03A does contain figures showing a single depth of masonry block grouted. I am attaching the document to this response, see page 3 for Figure 3 and page 6 for Figure 4. While there are other NCMA TEK documents, they tend to address above grade CMU walls and require full height grouting or fully grouted walls. You can contact NCMA directly for more details at ncma.org.

2) If only the top one or two masonry unit cells are required to be grouted how is the grout pour stopped at that level? NCMA TEK 05/03A does show adding a mesh or other material to stop grout flow in Figures 3 and 4.

3) Would grouting of anchor bolts in only the top one or two masonry unit cells be adequate to prevent shifting or uplift in an area prawn to higher wind speeds? Grouting only a portion of the wall will reduce the wall's capacity to resist uplift. It will likely also increase the potential for cracking in the mortar due to uplift. Again, the IRC has no procedure for determining when a wall is sufficiently grouted.

You may reply to this email to add comments to your request.

Sandra Hyde resolved this as Answered.

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Code opinions issued by ICC staff are based on ICC-published codes and do not include local, state or federal codes, policies or amendments. This opinion is based on the information which you have provided. We have made no independent effort to verify the accuracy of this information nor have we conducted a review beyond the scope of your question. This opinion does not imply approval of an equivalency, specific product, specific design, or specific installation and cannot be published in any form implying such approval by the International Code Council. As this opinion is only advisory, the final decision is the responsibility of the designated authority charged with the administration and enforcement of this code..

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TEK 05-03A

CONCRETE MASONRY FOUNDATION WALL DETAILS

INTRODUCTION

Concrete masonry is used to construct various foundation wall types, including full basement walls, crawlspace walls, stem walls and piers. Concrete masonry is well suited for below grade applications, because of its strength, durability, economy, and resistance to fire, insects and noise. The modular nature of concrete masonry allows floor plan and wall height changes to be easily accommodated as well. Concrete masonry can be used to provide a strong, durable, energy efficient and insect resistant foundation for all building types.

This TEK contains details for various types of concrete masonry foundation walls, with accompanying text as appropriate. The reader is referred to [TEK 3-11](#), Concrete Masonry Basement Wall Construction, [TEK 19-3B](#), Preventing Water Penetration in Below-Grade Concrete Masonry Walls and [NCMA's Basement Manual](#) for more detailed design and construction information (refs. 2, 3, 4, respectively).

Footings

Footings lie under the basement, crawlspace or stem wall and transfer structural loads from the building to the supporting soil. Footings are typically cast-in-place concrete, placed beneath the frost depth to prevent damage resulting from heaving caused by freezing of water in the soil.

Footings should be placed on undisturbed native soil, unless this soil is unsuitable, weak or soft. In this case, the soil should be removed and replaced with compacted soil, gravel or concrete. Similarly, tree roots, construction debris and ice should be removed prior to placing footings.

Unless otherwise required, footings should be carefully aligned so that the concrete masonry wall will be near the center line of the footing. Although the top surface of poured concrete footings should be relatively level, it should generally not be troweled smooth, as a slightly roughened surface enhances the bond between the mortar and concrete. Concrete footing design is governed by Building Code Requirements for Structural Concrete, ACI 318

(ref. 5), and concrete foundations are constructed with tolerances conforming to the requirements of Standard Specifications for Tolerances for Concrete Construction and Materials, ACI 117 (ref. 9).

BASEMENT WALLS

Basements are typically built as conditioned space so that they can be used for storage, work or living space. Because of this, water penetration resistance is of paramount importance to basement wall design and construction.

Following recommended backfill procedures will help prevent basement wall cracking during this operation. Walls should always be properly braced to resist backfill soil loads or have the first floor diaphragm in place prior to backfilling. Otherwise, a wall designed to be supported at the top may crack or even fail from overstressing the wall. Similarly, heavy equipment, such as bulldozers or cranes, should not be operated over the backfill during construction unless the basement walls are appropriately designed for the higher resulting loads.

The top 4 to 8 in. (102 to 203 mm) of backfill should be low permeability soil so rain water absorption into the backfill is minimized. Finished grade should be sloped away from the building.

Control joints are not typically used in foundation walls due to concerns with waterproofing the joint and the fact that shrinkage is less significant in below grade walls due to relatively constant temperature and moisture conditions. If warranted, horizontal joint reinforcement can be installed as a crack control measure.

The foundation drain shown in Figures 1 and 2 can also be located on the interior side of the footing, or on both sides if necessary. The drain should be placed below the top of the footing. The optional footing drain shown, such as 2 in. (51 mm) PVC pipe at 8 ft (2400 mm) on center, allows water on the interior to reach the foundation drain. Footing drains can either be cast into the footing or constructed using plastic pipes through the bottom of the first course of masonry, directly on top of the footing.

For reinforced construction (Figure 2), reinforcing bars must be properly located to be fully functional. In most cases, vertical reinforcement is positioned towards the interior face of below grade walls to provide the greatest resistance to soil pressures.

A solid top course on the below grade concrete masonry wall spreads loads from the building above and also improves soil gas and termite resistance. Where only the top course is to be grouted, wire mesh or another equivalent grout stop material can be used to contain the grout to the top course.

Note that local codes may restrict the use of foam plastic insulation below grade in areas where the hazard of termite damage is high.

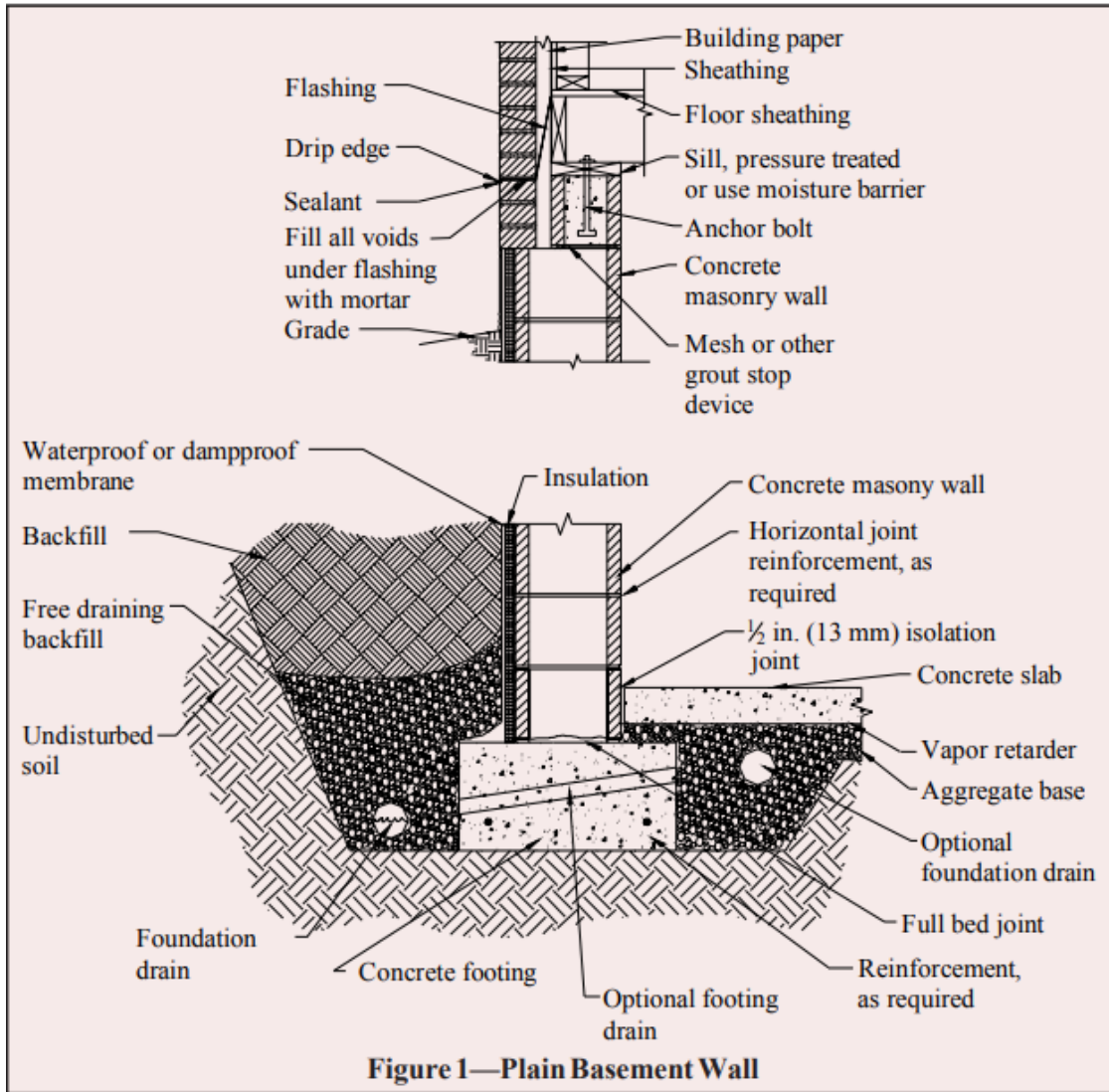


Figure 1—Plain Basement Wall

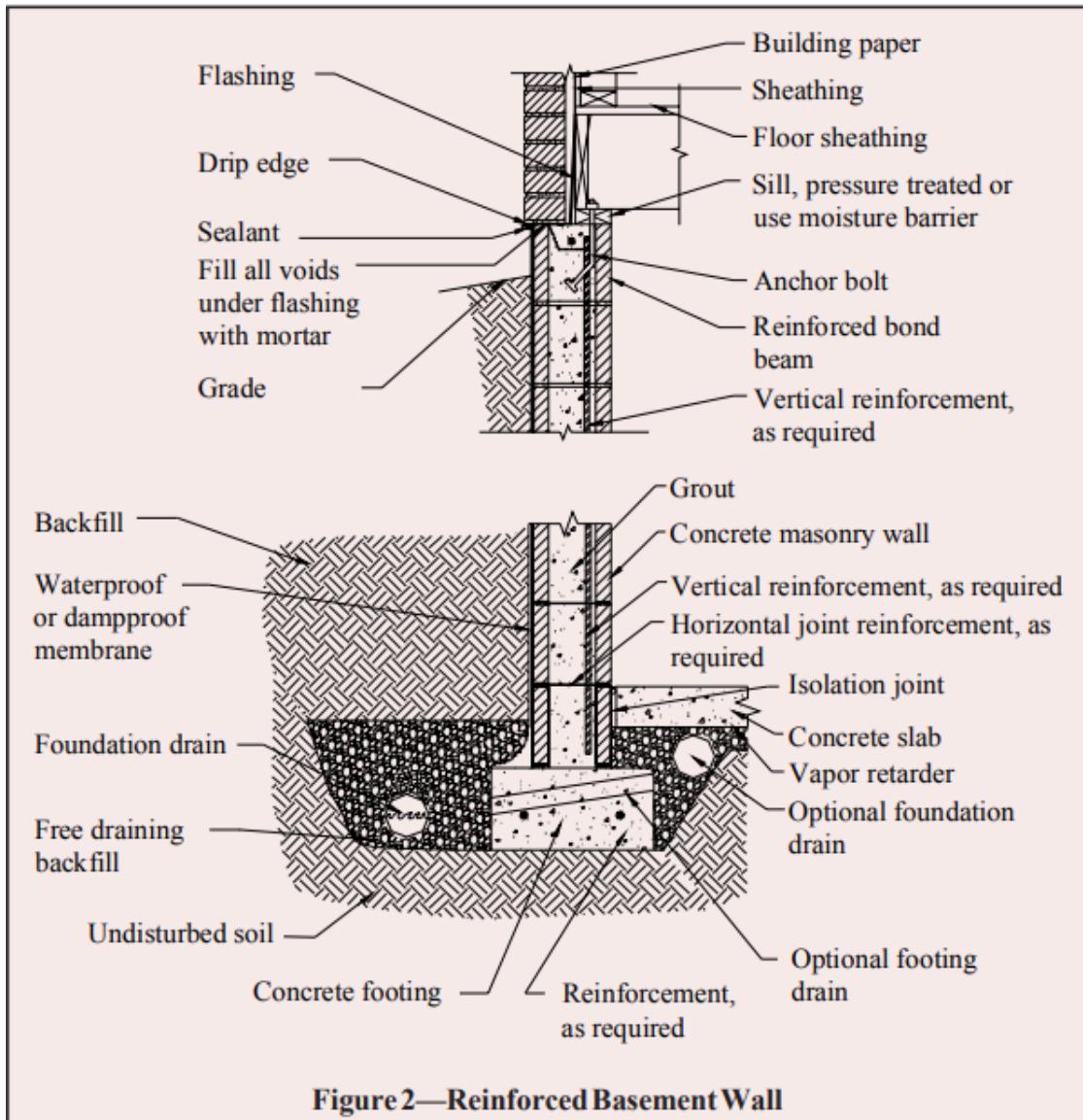


Figure 2—Reinforced Basement Wall

📷 Figure 2—Reinforced Basement Wall

STEMWALLS FOR CRAWLSPACES

Unlike basements, crawlspaces are typically designed as unconditioned spaces, either vented or unvented. Several alternate crawlspace constructions are shown in Figures 3 and 4.

Although most building codes require operable louvered vents near each corner of a crawlspace to reduce moisture buildup, research has shown that the use of a moisture retardant ground cover eliminates the need for vents in many locations (ref. 6). If the crawlspace is vented, the floor, exposed pipes and ducts are typically insulated. If unvented, either the walls or the floor above can be insulated. Unvented crawlspaces must have a floor covering to minimize moisture and, where applicable, soil gas entry. A vapor retarder (typically 6-mil

(0.15 mm) polyethylene, PVC or equivalent) is good practice to minimize water migration and soil gas infiltration. A 2 ½ in. (64 mm) concrete mud slab is generally used when a more durable surface is desired for access to utilities. A thicker concrete slab may be desirable, particularly if the crawlspace will be used for storage. A dampproof coating on the exterior crawlspace wall will also help prevent water entry into the crawlspace.

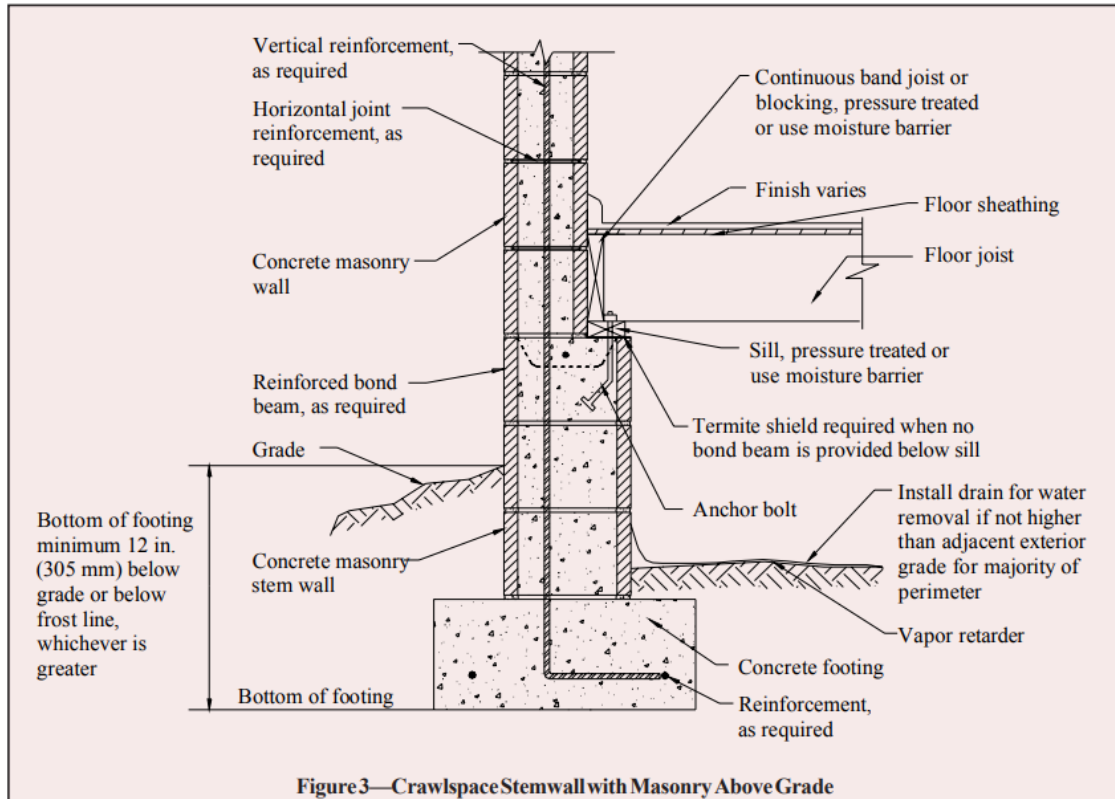


Figure 3—Crawlspace Stemwall with Masonry Above Grade

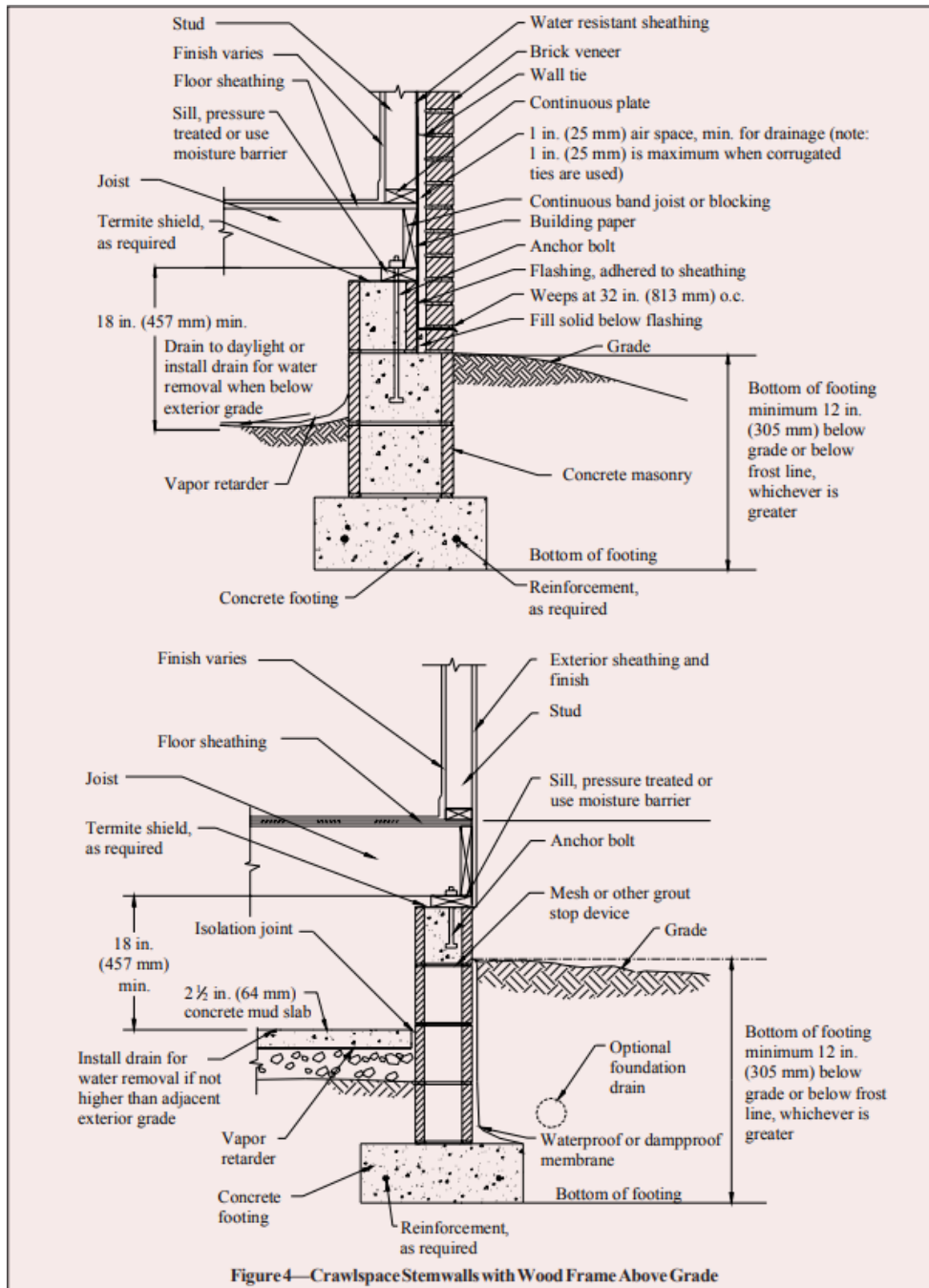


Figure 4—CrawlSpace Stemwalls with Wood Frame Above Grade

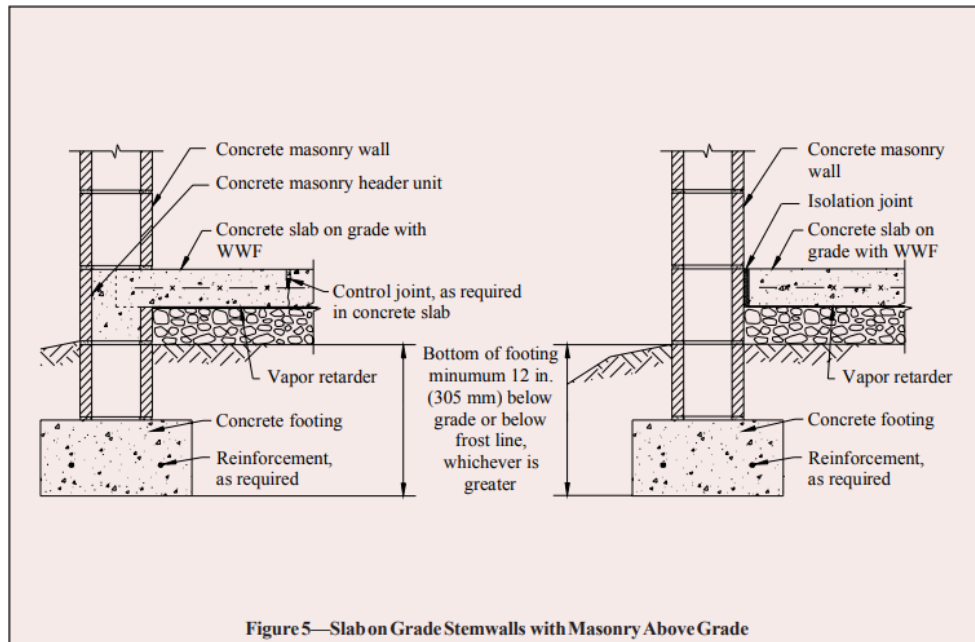
STEMWALLS FOR SLAB ON GRADE

A stemwall with slab on grade supports the wall above and often also provides a brick ledge to support an exterior masonry veneer. Figures 5 and 6 show concrete masonry stemwalls with masonry and with frame above grade walls, respectively.

Because the wall is exposed to soil on both sides, waterproofing or dampproofing coatings are generally not required. Stemwalls are typically insulated on the exterior of the masonry.

If insulated on the interior, it is important to place insulation in the joint between the slab edge and the foundation wall to avoid thermal bridging.

A stemwall with brick ledge is shown in Figure 6. For this case, note that masonry design codes typically require a minimum 1 in. (25 mm) clear air space between the masonry and backup to ensure an open drainage cavity. A 1 in. (25 mm) air space is considered appropriate if special precautions are taken to keep the air space clean (such as by beveling the mortar bed away from the cavity or by drawing a piece of wood up the cavity to collect mortar droppings). Otherwise, a 2 in. (51 mm) air space is preferred.



📷 Figure 5—Slab on Grade Stemwalls with Masonry Above Grade

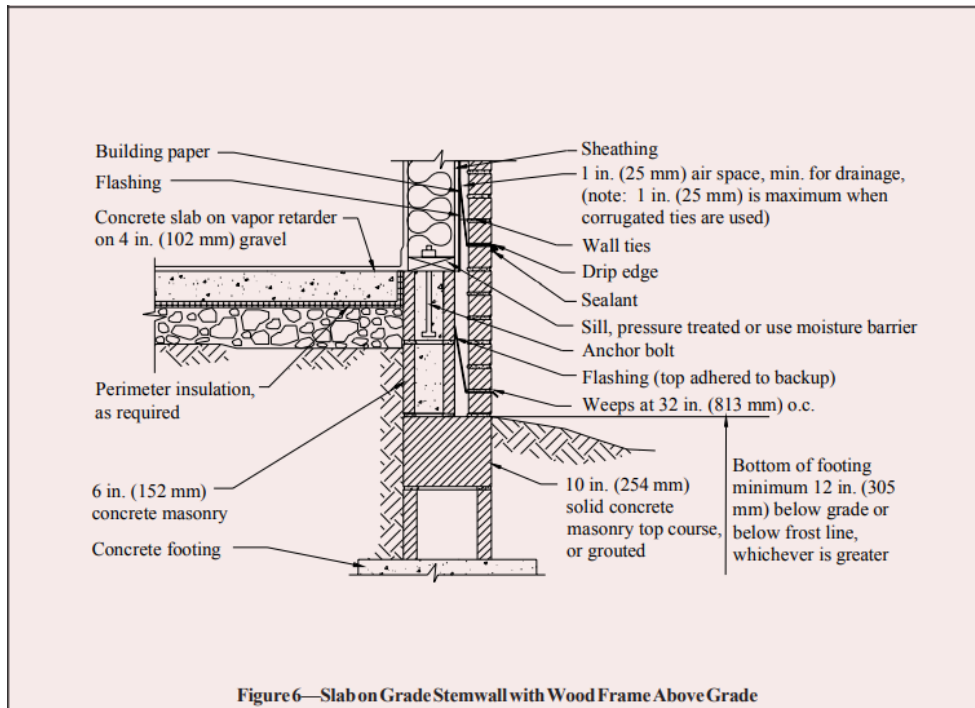


Figure 6—Slab on Grade Stemwall with Wood Frame Above Grade

FOUNDATION PIERS

Foundation piers (see Figure 7) are isolated structural elements used to support the building above. Structural design ensures the piers are sized and spaced to carry the necessary building loads. Piers typically are in enclosed crawlspaces, so recommendations for moisture and soil gas resistance for crawlspaces should be followed for piers as well. Building Code Requirements for Masonry Structures (ref. 7) requires a foundation pier to have a minimum nominal thickness of 8 in. (203 mm), with a nominal height not exceeding four times its nominal thickness and a nominal length not exceeding three times its nominal thickness. Note that the International Building Code, (ref. 8) allows foundation piers to have a nominal height up to ten times the nominal thickness if the pier is solidly grouted, or four times the nominal thickness if it is not solidly grouted.

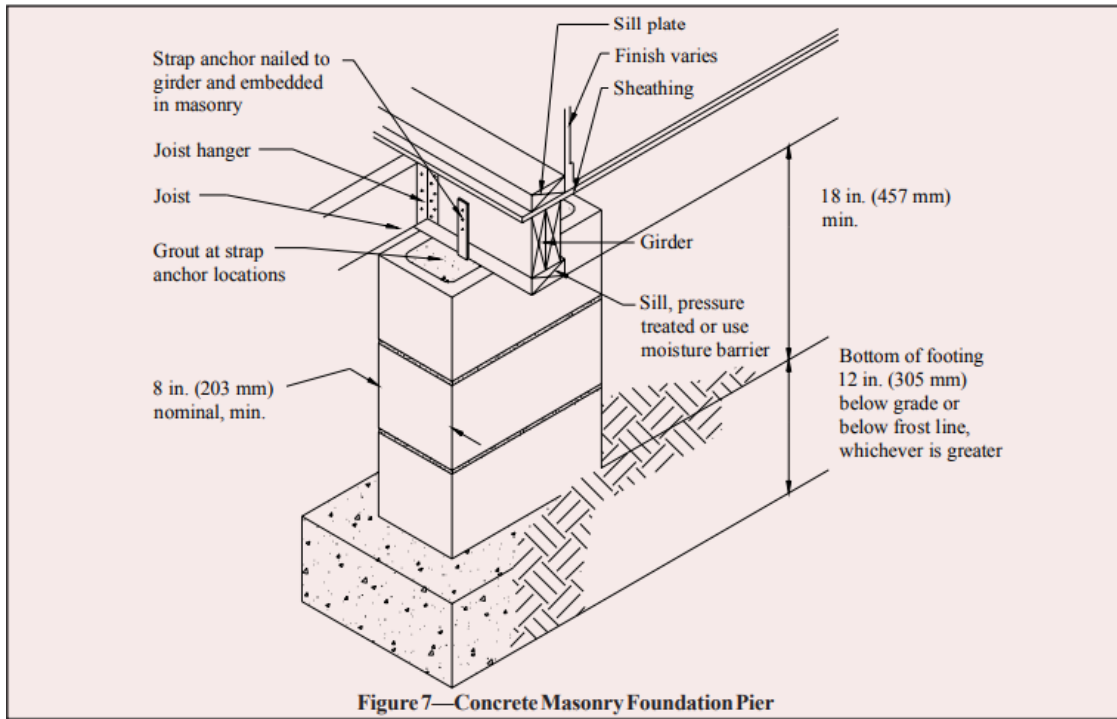


Figure 7—Concrete Masonry Foundation Pier

References

1. Annotated Design and Construction Details for Concrete Masonry, [TR 90A](#). National Concrete Masonry Association, 2002.
2. Concrete Masonry Basement Wall Construction, [TEK 3-11](#). National Concrete Masonry Association, 2001.
3. Preventing Water Penetration in Below-Grade Concrete Masonry Walls, [TEK 19-3B](#). National Concrete Masonry Association, 2012.
4. Basement Manual, Design and Construction Using Concrete Masonry, [TR 149](#). National Concrete Masonry Association, 2001.
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6. 2001 ASHRAE Handbook, Fundamentals. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 2001.
7. Building Code Requirements for Masonry Structures, ACI 530-02/ASCE 5-02/TMS 402-02. Reported by the Masonry Standards Joint Committee, 2002.
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9. Standard Specifications for Tolerances for Concrete Construction and Materials, ACI 117-90. American Concrete Institute, 1990.

NCMA TEK 5-3A, Revised 2003.

NCMA and the companies disseminating this technical information disclaim any and all responsibility and liability for the accuracy and the application of the information contained in this publication.

Keywords

architectural details

basement wall

crawlspace wall

crawlspace walls

foundation wall

pier

plain concrete masonry

reinforced concrete masonry

residential details

stem walls piers

stemwall

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State Building Code Technical Review Board Policy #32

Title: Photograph submittals by the parties to an application for appeal.

Authority: Section 36-108 et seq. of the Code of Virginia

Policy Statement: It shall be the policy of the State Building Code Technical Review Board (Board) that all photographs to be used as evidence in an appeals hearing shall be correlated to the applicable cited code violation, included a date stamp, and list the individual who took the photograph.

Approval and Review: This Board policy was reviewed and approved on 07/21/2023.

Board Chair at Last Review: James R. Dawson

DHCD Director: Bryan Horn

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