

General Stakeholder Workgroup Meetings
June 7-15, 2022
9:00 a.m. Each Day
Virtual Meeting: <https://vadhcd.adobeconnect.com/va2021cdc/>

AGENDAS

June 7, 2022
(Begin at 9:00 am)

VCC Proposals

1. B105.1.1-21
2. B107.1-21
3. B108.2-21
4. B108.3-21
5. B109.4.1-21
6. B113.3-21
7. B115.2-21
8. B118-21
9. B202-21
10. B202(2)-21
11. B407.4-21
12. B432(2)-21
13. B433-21
14. B706.1-21
15. B706.1.1-21
16. B903.2.3-21
17. B903.4.2-21
18. B907.5.2.3.2-21
19. B918.1-21
20. B918.1(2)-21
21. B918.1.1-21
22. B1006.3.4-21

23. B1010.2.8-21
24. B1020.1-21
25. B1022.2.3-21
26. B1103.2.15-21
27. B1112.1-21
28. B1602-21
29. B2403.6-21
30. B3005.4-21
31. B3006.1-21
32. B3007.6-21
33. B3008.1-21
34. B3302.4-21
35. BF202-21
36. BF608.9-21
37. BF608.17-21
38. BF608.17-21(2)
39. BF911.1-21
40. BF5003.1.1(1)-21
41. AD75-21
42. IB120-21

General Stakeholder Workgroup Meeting Descriptions (Subject Groupings)

VCC: Virginia Construction Code (USBC Part I) including USBC Part I administrative provisions; IBC; VCS; VADR; IBSR; and MHSR (**Proposal Designations in cdpVA:** B; BF; IB; MH; CS; AD)

VEBC: Virginia Existing Building Code (USBC Part II) including USBC Part II administrative provisions; and IEBC (**Proposal Designations in cdpVA:** EB)

Energy: All technical energy provisions of the VCC, IECC and IRC; does not include administrative provisions (**Proposal Designations in cdpVA:** EC; REC)

VMC: Virginia Maintenance Code (USBC Part III) including USBC Part III administrative provisions (**Proposal Designations in cdpVA:** PM)

SFPC: Virginia Statewide Fire Prevention Code including SFPC administrative provisions (**Proposal Designations in cdpVA:** FP)

VRC: Residential technical provisions of the VCC and the IRC; does not include administrative or trades provisions (**Proposal Designations in cdpVA:** RB)

Trades: All technical trade provisions (mechanical, electrical, plumbing and fuel gas), including residential trade provisions, of the VCC, IRC, IPC, IMC, and IFGC; does not include administrative provisions (**Proposal Designations in cdpVA:** M; P; E; RE; RM; RP)

2021 cdpVA Proposal Subject Matter Designations (cdpVA Proposal Name “Agenda Number” Prefixes)

The following prefixes will be utilized as part of each proposal name to assist in identifying the subject matter of the proposal. DHCD staff assign proposal names after they have been submitted, reviewed and before they are placed in “Ready for Public Comment” status.

B = Virginia Construction Code
EB = Virginia Existing Building Code
PM = Virginia Maintenance Code
FP = Statewide Fire Prevention Code
BF = Virginia Construction Code IFC
EC = Virginia Energy Conservation Code
M = Virginia Mechanical Code
P = Virginia Plumbing Code
E = VCC Electrical
RB = Virginia Residential Code
REC = Virginia Residential Code Energy
RE = Virginia Residential Code Electric
RM = Virginia Residential Code Mechanical
RP = Virginia Residential Code Plumbing
IB = Industrialized Building Safety Regulations
MH = Manufactured Home Safety Regulations
AD = Virginia Amusement Device Regulations
CS = Virginia Certification Standards

Example: cdpVA Proposal Agenda Number “**RM**2301.1-21” indicates a proposal to the mechanical provisions (VRC Section M2301.1) of the 2021 Virginia Residential Code.

B105.1.1-21

Proponents: Resiliency Sub-Workgroup

2018 Virginia Construction Code

Revise as follows:

105.1.1 Qualifications of building official. The *building official* shall have at least 5 years of *building* experience as a licensed professional engineer or architect, *building*, fire or trade inspector, contractor, housing inspector or superintendent of *building*, fire or trade *construction* or at least 5 years of *building* experience after obtaining a degree in architecture or engineering, with at least 3 years in responsible charge of work. Any combination of education and experience that would confer equivalent knowledge and ability shall be deemed to satisfy this requirement. The *building official* shall have general knowledge of sound engineering practice in respect to the design and *construction* of *structures*, the basic principles of fire prevention, the accepted requirements for means of egress and the installation of elevators and other service equipment necessary for the health, safety and general welfare of the occupants and the public. The building official shall have general knowledge of the principles and requirements of floodplain and high-velocity wind construction. The *local governing body* may establish additional qualification requirements.

105.2.1 Qualifications of technical assistants. A *technical assistant* shall have at least 3 years of experience and general knowledge in at least one of the following areas: *building construction*; *building construction* conceptual and administrative processes; *building*, fire or housing inspections; plumbing, electrical or mechanical trades; or fire protection, elevator or property maintenance work. Any combination of education and experience that would confer equivalent knowledge and ability, including high school technical training programs or college engineering, architecture, or construction degree programs, shall be deemed to satisfy this requirement. Technical assistants shall have general knowledge of the principles and requirements of floodplain and high-velocity wind construction. The *locality* may establish additional qualification requirements.

Reason Statement: This proposal comes from the Resiliency Sub-workgroup and seeks to increase the knowledge base of building officials and technical assistants by requiring people in these positions to have general knowledge of the principles and requirements of floodplain and high-velocity wind construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
None

Resiliency Impact Statement: This proposal will increase Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B105.1.1-21

This proposal doesn't have any public comments.

B107.1-21

Proponents: DHCD Staff (sbco@dhcd.virginia.gov)

2018 Virginia Construction Code

Revise as follows:

107.1 Authority for charging fees. In accordance with § 36-105 of the Code of Virginia, fees may be levied by the *local governing body* in order to defray the cost of enforcement of the USBC. With the exception of the levy collected pursuant to Section 107.2, fees levied pursuant to this section shall be used only to support the functions of the local building department.

Note: See subsection D of § 36-105 of the Code of Virginia for rules for permit fees involving property with easements or liens.

107.1.1 Fee schedule.

The *local governing body* shall establish a fee schedule incorporating unit rates, which may be based on square footage, cubic footage, estimated cost of *construction* or other appropriate criteria. A permit or any amendments to an existing permit shall not be issued until the designated fees have been paid, except that the *building official* may authorize the delayed payment of fees.

107.1.2 Refunds.

When requested in writing by a *permit holder*, the *locality* shall provide a fee refund in the case of the revocation of a permit or the abandonment or discontinuance of a *building* project. The refund shall not be required to exceed an amount which correlates to work not completed.

107.1.3 Fees for generators used with amusement devices.

Fees for generators and associated wiring used with amusement devices shall only be charged under the VADR.

Reason Statement: The proposal is intended to update the VCC with the current law. For more information please see attached HB1966, passed during the 2019 General Assembly Session, or visit <https://lis.virginia.gov/cgi-bin/legp604.exe?191+ful+CHAP0698+hil>.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Although this would be difficult to quantify, it could be argued that by ensuring permit fees are not diverted to other departments, but used solely for the purpose of USBC enforcement, other fees associated with building permits (i.e. re-inspection fees) could potentially be reduced. As such, it could be argued that the proposal could actually reduce the cost of construction.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency. The proposal is meant to bring the VCC text in line with current law, which clarifies that fees levied by building departments are to be used only to support the functions of the building department. Ensuring that permit fees are not diverted to other departments could potentially result in additional code enforcement staff and/or resources, which in turn could translate in improved code compliance. As such, an argument could be made that this clarification has the potential of increasing overall resiliency. However, given that the intent has always been for the fees levied to be used towards defraying the cost associated with the enforcement of the USBC, it could also be argued that the proposal would have a neutral impact on resiliency.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: B107.1-21

This proposal doesn't have any public comments.

Proposal # 1129

B108.2-21

Proponents: David Sharp (David.Sharp@fairfaxcounty.gov)

2018 Virginia Construction Code

Revise as follows:

108.2 Exemptions from application for permit. Notwithstanding the requirements of Section 108.1, application for a permit and any related inspections shall not be required for the following; however, this section shall not be construed to exempt such activities from other applicable requirements of this code. In addition, when an *owner* or an *owner's* agent requests that a permit be issued for any of the following, then a permit shall be issued and any related inspections shall be required.

1. Installation of wiring and *equipment* that (i) operates at less than 50 volts, (ii) is for broadband communications systems, (iii) is exempt under Section 102.3(1) or 102.3(4), or (iv) is for monitoring or automation systems in *dwelling units*, except when any such installations are located in a plenum, penetrate fire-rated or smoke-protected *construction* or are a component of any of the following:
 - 1.1. Fire alarm system.
 - 1.2. Fire detection system.
 - 1.3. Fire suppression system.
 - 1.4. Smoke control system.
 - 1.5. Fire protection supervisory system.
 - 1.6. Elevator fire safety control system.
 - 1.7. Access or egress control system or delayed egress locking or latching system.
 - 1.8. *Fire damper*.
 - 1.9. Door control system.
2. One-story detached *structures* used as tool and storage sheds, playhouses or similar uses, provided the *building area* does not exceed 256 square feet (23.78 m²) and the *structures* are not classified as a Group F-1 or H occupancy.
3. Detached prefabricated buildings housing the *equipment* of a publicly regulated utility service, provided the floor area does not exceed 150 square feet (14 m²).
4. Tents or air-supported *structures*, or both, that cover an area of 900 square feet (84 m²) or less, including within that area all connecting areas or spaces with a common means of egress or entrance, provided such tents or *structures* have an *occupant load* of 50 or less persons.
5. Fences of any height unless required for pedestrian safety as provided for by Section 3306, or used for the barrier for a *swimming pool*.
6. Concrete or masonry walls, provided such walls do not exceed 6 feet (1829 mm) in height above the finished grade. Ornamental column caps shall not be considered to contribute to the height of the wall and shall be permitted to extend above the 6-foot (1829 mm) height measurement.
7. Retaining walls supporting less than 3 feet (914 mm) of unbalanced fill that are not constructed for the purpose of impounding Class I, II or III-A liquids or supporting a surcharge other than ordinary unbalanced fill.
8. *Swimming pools* that have a surface area not greater than 150 square feet (13.95 m²), ~~do not exceed 5,000 gallons (19,000 L)~~ and are less than 24 inches (610 mm) deep.
9. Signs under the conditions in Section H101.2 of Appendix H.
10. Replacement of above-ground existing LP-gas containers of the same capacity in the same location and associated regulators when installed by the serving gas supplier.
11. Flagpoles 30 feet (9144 mm) or less in height.
12. Temporary ramps serving *dwelling units* in Groups R-3 and R-5 occupancies where the height of the entrance served by the ramp is no more than 30 inches (762 mm) above grade.
13. *Construction* work deemed by the *building official* to be minor and ordinary and which does not adversely affect public health or general safety.

14. Ordinary repairs that include the following:

- 14.1. Replacement of windows and doors with windows and doors of similar operation and opening dimensions that do not require changes to the existing framed opening and that are not required to be fire rated in Group R-2 where serving a single *dwelling unit* and in Groups R-3, R-4 and R-5.
 - 14.2. Replacement of plumbing fixtures and well pumps in all groups without alteration of the water supply and distribution systems, sanitary drainage systems or vent systems.
 - 14.3. Replacement of general use snap switches, dimmer and control switches, 125 volt-15 or 20 ampere receptacles, luminaires (lighting fixtures) and ceiling (paddle) fans in Group R-2 where serving a single *dwelling unit* and in Groups R-3, R-4 and R-5.
 - 14.4. Replacement of mechanical appliances provided such *equipment* is not fueled by gas or oil in Group R-2 where serving a single-family dwelling and in Groups R-3, R-4 and R-5.
 - 14.5. Replacement of an unlimited amount of *roof covering* or siding in Group R-3, R-4 or R-5 provided the *building* or *structure* is not in an area where the nominal design wind speed is greater than 100 miles per hour (44.7 meters per second) and replacement of 100 square feet (9.29 m²) or less of *roof covering* in all groups and all wind zones.
 - 14.6. Replacement of 256 square feet (23.78 m²) or less of roof decking in Group R-3, R-4 or R-5 unless the decking to be replaced was required at the time of original *construction* to be fire-retardant-treated or protected in some other way to form a fire-rated wall termination.
 - 14.7. Installation or replacement of floor finishes in all occupancies.
 - 14.8. Replacement of Class C interior wall or ceiling finishes installed in Groups A, E and I and replacement of all classes of interior wall or ceiling finishes in other groups.
 - 14.9. Installation or replacement of cabinetry or trim.
 - 14.10. Application of paint or wallpaper.
 - 14.11. Other repair work deemed by the *building official* to be minor and ordinary which does not adversely affect public health or general safety.
15. Crypts, mausoleums, and columbaria *structures* not exceeding 1,500 square feet (139.35 m²) in area if the *building* or *structure* is not for occupancy and used solely for the interment of human or animal remains and is not subject to *special inspections*.
16. Billboard safety upgrades to add or replace steel catwalks, steel ladders, or steel safety cable.

Exceptions:

1. Application for a permit may be required by the *building official* for the installation of replacement siding, roofing and windows in buildings within a historic district designated by a *locality* pursuant to § 15.2-2306 of the Code of Virginia.
2. Application for a permit may be required by the *building official* for any items exempted in this section that are located in a special *flood hazard area*.

Reason Statement: There is no combination of square footage less than 150 square feet and less than 24" that can result in a capacity greater than 5000 gallons. Thus the condition for the capacity to be less than 5000 gallons is already met when each of the other conditions for permit exemption is met.

300 cubic feet - a 150 sq ft pool at 24 inches deep - would hold 2, 244 gallons. So if the pool is less than the required dimension, it will already be below the capacity limit, making that condition unnecessary and confusing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost associated with this change.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
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Public Comments for: B108.2-21

This proposal doesn't have any public comments.

B108.3-21

Proponents: Allison Cook (acook1@arlingtonva.us)

2018 Virginia Construction Code

Revise as follows:

108.3 Applicant information, processing by mail. Application for a permit shall be made by the *owner* or lessee of the relevant property or the agent of either or by the RDP, contractor or subcontractor associated with the work or any of their agents. The full name and address of the *owner*, lessee and applicant shall be provided in the application. If the *owner* or lessee is a corporate body, when and to the extent determined necessary by the *building official*, the full name and address of the *responsible* officers shall also be provided.

A permit application may be submitted by mail and such permit applications shall be processed by mail, unless the jurisdiction offers an online permit option for permit application and processing or the applicant voluntarily chooses otherwise. In no case shall an applicant be required to appear in person.

The *building official* may accept applications for a permit through electronic submissions provided the information required by this section is obtained.

Reason Statement: With COVID, many jurisdictions offered online submission options and were not opened to the public for the applicant to come in person to submit an application and process a permit. Jurisdictions should not be required to accept applications by mail if an online option is available. If customers are mailing an application, then they already have the ability to go online to download the application to mail it in. This does not prevent in-person services, it only allows for greater flexibility for jurisdictions that have moved towards online systems since COVID.

Cost Impact: The code change proposal will decrease the cost of construction
Allowing for an online option instead of a mail-in (paper) option reduces the cost to local jurisdictions that want to move to all digital permitting services. It also reduces costs for architects and builders to submit digitally, rather than via mail/paper. Ultimately, reducing the cost of construction.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B108.3-21

This proposal doesn't have any public comments.

B109.4.1-21

Proponents: David Kidd (vabldgofficial@yahoo.com)

2018 Virginia Construction Code

Revise as follows:

109.4.1 Expedited construction document review. The *building official* may accept reports from an *approved* person or agency that the *construction documents* have been examined and conform to the requirements of the USBC and ~~may shall~~ establish requirements for the person or agency submitting such reports. In addition, where such reports have been submitted, the *building official* may expedite the issuance of the permit. The established requirements shall include active DHCD certificates for the services being rendered.

[A] APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests, furnishing inspection services or furnishing product certification where such agency has been *approved* by the *building official*. The approved agency and/or personnel performing the work shall be certified by DHCD for the types of inspection and plan review services being rendered. The building official shall review required certifications and maintain a record of approval.

Reason Statement: Currently 3rd party plan reviewers are not required to have Va DHCD certification to perform plan reviews in the disciplines being performed. Plan reviews by these agencies/persons lend themselves to being incorrect due to lack of knowledge of the Virginia amendments. I request consideration to change the definition of approved agency to require DHCD certifications in the plan review categories for which a plan review is being performed and approved by the agency staff. Such certifications from DHCD must be provided to the building official for review and consideration to be an approved reviewer.

Argument for this change: With the current language **any** person can be considered approved by the building official regardless of qualifications or certifications. An ICC cert does NOT provide the knowledge of Virginia amendments to accurately perform in-depth reviews. A professional engineer or architect have the same qualifications as the individuals designing the construction documents and we often find violations from their designs but yet we expect their peers to have better abilities to perform document review. If we as inspectors and plan reviewers are required to have DHCD certifications, then why are 3rd party plan reviewers and inspectors not required to have the same qualifications?

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No foreseeable cost impact to construction cost.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B109.4.1-21

Discussion by David Kidd

Mar 25, 2022 16:59 UTC

I request consideration to change the definition of approved agency to require DHCD certifications in the plan review categories for which a plan review is being performed and approved by the agency staff. Such certifications from DHCD must be provided to the building official for review and consideration to be an approved reviewer.

I also request consideration to include a new definition for approved person as described in VCC section 109.4.1 ...*approved person or agency*... to further describe and require any or all persons performing plan reviews for a building official must have DHCD certifications as a plan reviewer in all disciplines for which plan reviews are being performed and approved.

Argument for this change: With the current language **any** person can be considered approved by the building official regardless of qualifications or certifications. An ICC cert does NOT provide the knowledge of Virginia amendments to accurately perform in-depth reviews. A professional engineer or architect have the same qualifications as the individuals designing the construction documents and we often find violations from their designs but yet we expect their peers to have better abilities to perform document review. If we as inspectors and plan reviewers are required to have DHCD certifications, then why are 3rd party plan reviewers and inspectors not required to have the same qualifications?

Attachments: <https://va.cdpaccess.com/proposal/1085/discuss/130/file/download/581/DKidd%20VDHCD%20Certification%201.6.22.pdf>

B113.3-21

Proponents: Resiliency Sub-Workgroup

2018 Virginia Construction Code

Revise as follows:

113.3 Minimum inspections. The following minimum inspections shall be conducted by the *building official* when applicable to the *construction* or permit:

1. Inspection of footing excavations and reinforcement material for concrete footings prior to the placement of concrete.
2. Inspection of foundation systems during phases of *construction* necessary to assure compliance with this code.
3. Inspection of preparatory work prior to the placement of concrete.
4. Inspection of the elevation of the *lowest floor* in accordance with Section 113.3.2 prior to further vertical construction located in any *flood hazard area* or *special flood hazard area*.
- ~~4.~~ 5. Inspection of structural members and fasteners prior to concealment.
- ~~5.~~ 6. Inspection of electrical, mechanical and plumbing materials, *equipment* and systems prior to concealment.
- ~~6.~~ 7. Inspection of energy conservation material prior to concealment.
8. Inspection in accordance with Section 113.3.3 prior to final inspection located in any *flood hazard area* or *special flood hazard area*.
- ~~7.~~ 9. Final inspection.

Reason Statement: This proposal comes from the Resiliency Sub-workgroup and seeks to delineate specific inspection requirements for buildings and structures in flood hazard areas and special flood hazard areas.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
None.

Resiliency Impact Statement: This proposal will increase Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: B113.3-21

This proposal doesn't have any public comments.

B115.2-21

Proponents: David Sharp (David.Sharp@fairfaxcounty.gov)

2018 Virginia Construction Code

Revise as follows:

115.2 Notice of violation. The *building official* shall issue a written notice of violation to the permit holder responsible party as set forth in Section 112.1 if any violations of this code or any directives or orders of the *building official* have not been corrected or complied with within a reasonable time. When the owner of the building or structure or the tenants of such building or structure are not the party to whom the notice of violation is issued, then a copy of the notice shall also be delivered to the owner or tenants. ~~The building official may also issue a notice of violation to other persons found to be responsible in addition to the permit holder. If the violations, directives, or orders involve work without a permit, the notice of violation shall be issued to the responsible party.~~

The notice shall reference the code section upon which the notice is based and direct the correction of the violation or the compliance with such directive or order and specify a reasonable time period within which the corrections or compliance must occur. The notice shall be issued by either delivering a copy by mail to the last known address of the *permit holder* or responsible party, by delivering the notice in person, by leaving it in the possession of any person in charge of the premises, or by posting the notice in a conspicuous place if the person in charge of the premises cannot be found. The notice of violation shall indicate the right of appeal by referencing the appeals section. ~~When the owner of the building or structure or the tenants of such building or structure are not the party to whom the notice of violation is issued, then a copy of the notice shall also be delivered to the owner or tenants.~~

Note: A notice of *unsafe building or structure* for structures that become unsafe during the *construction* process is issued in accordance with Section 118.

115.2.1 Notice not to be issued under certain circumstances.

When violations are discovered more than 2 years after the certificate of occupancy is issued or the date of initial occupancy, whichever occurred later, or more than 2 years after the *approved* final inspection for an alteration or renovation, a notice of violation shall only be issued upon advice from the legal counsel of the *locality* that action may be taken to compel correction of the violation. When compliance can no longer be compelled by prosecution under § 36-106 of the Code of Virginia, the *building official*, when requested by the building *owner*, shall document in writing the existence of the violation noting the edition of the USBC the violation is under.

Reason Statement: Section 112.1 is clear that the person who is responsible for securing the results intended by Code is the person who performs the work - regardless of whether that individual "holds" the permit. Moreover, because a building code violation is a criminal offense (non-classified misdemeanor), the section as it currently exists may result in charging the permit holder with a criminal act, even if they were, in fact, the victim in the situation. Issuing the NOV to the "responsible party" as set forth in Section 112.1 brings these sections into agreement and ensures that the individual who violates the Code is charged with the criminal act.

In the event that the "Responsible Party" flees and the code official is unable to force compliance through pursuit of the responsible party, the language of the section already provides for additional measures. By issuing a copy of the NOV to the owner of the structure when they are not the responsible party, a path is already in place to pursue a code compliant structure with the owner or tenant when other appropriate measures fail. Relocating this language within the section helps to clarify this point.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This change will not result in any additional costs. The change is purely to administrative procedures.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final

- Non-Consensus
 - None
-

Public Comments for: B115.2-21

This proposal doesn't have any public comments.

Proposal # 1147

B118-21

VCC: SECTION 202, SECTION 118, 118.1, 118.2, 118.3, 118.4, 118.4.1, 118.5, 118.6, 118.7, 118.8

Proponents: Ronald Clements (clementsro@chesterfield.gov)

2018 Virginia Construction Code

Delete without substitution:

~~**UNSAFE BUILDING OR STRUCTURE.** Any *building or structure* that is under *construction* and has not received a permanent certificate of occupancy, final inspection, or for which a permit was never issued or has expired and has been determined by the *building official* to be of faulty *construction* that is so damaged, decayed, dilapidated, structurally unsafe, or of such faulty *construction* or unstable foundation that partial or complete collapse is likely, or any unfinished *construction* that does not have a valid permit, or the permit has been revoked, and the condition of the unfinished *construction* presents an immediate serious and imminent threat to the life and safety of the occupants or the public.~~

Revise as follows:

SECTION 118

UNSAFE BUILDINGS OR STRUCTURES THAT BECOME A THREAT TO PUBLIC SAFETY DURING CONSTRUCTION

~~**118.1 Applicability General.** This section applies to unsafe *buildings or structures*.~~

Any building or structure that is under construction and has not received a permanent certificate of occupancy, or final inspection if a CO will not be issued, that has been determined by the building official to be a threat to public safety due to faulty construction, deterioration, damage, structural instability, or another condition that presents an immediate threat to public safety, shall be made safe through compliance with this code or shall be demolished and removed if determined necessary by the building official.

~~**Note:** Existing buildings and *structures* other than those under *construction* or subject to this section are subject to the VMG, which also has requirements for unsafe conditions.~~

Delete without substitution:

~~**118.2 Repair or removal of unsafe buildings or structures.** Any *unsafe building or structure* shall be made safe through compliance with this code or shall be taken down and removed if determined necessary by the *building official*.~~

Revise as follows:

~~**118.3 118.2 Inspection report Correction notice.** The ~~building~~ The building official shall inspect any reported *unsafe building or structure* and shall prepare a report to be filed in the records of the *local building department*. In addition to a description of any unsafe conditions found, the report shall include the occupancy classification of the *building or structure* and the nature and extent of any damages caused by collapse or failure of any *building components*.~~ issue a correction notice that describes the condition of the structure that is the basis for the determination that a violation of section 118 exists. The correction notice shall state what is required to correct the violation and provide a reasonable time to make the corrections; or, if the structure is required to be demolished, the notice shall specify the time period with which the demolition must occur.

~~**118.4 118.3 Notice of unsafe building or structure violation.** When a *building or structure* is determined by the *building official* to be an *unsafe building or structure*, a written notice of *unsafe building or structure* shall be issued by personal service to the *owner*, the *owner's agent*, or the person in control of such *building or structure*. The notice shall specify the corrections necessary to comply with this code and specify the time period within which the repairs must occur, or if the notice specifies that the *unsafe building or structure* is required to be demolished, the notice shall specify the time period within which demolition must occur.~~ the violation has not been corrected in accordance with the correction notice issued per Section 118.2, the building official is authorized to issue a notice of violation in accordance with section 115 of this code.

~~**Note:** Whenever possible, the notice should also be given to any tenants or occupants of the *unsafe building or structure*.~~

Delete without substitution:

~~**118.4.1 Vacating unsafe building or structure.** If the *building official* determines there is actual and immediate danger to the occupants or public, or when life is endangered by the occupancy of an *unsafe building or structure*, the *building official* shall be authorized to order the occupants to immediately vacate the *unsafe building or structure*. When an *unsafe building or structure* is ordered to be vacated, the *building official* shall post a notice at each entrance that reads as follows:~~

~~"This Building (or Structure) is Unsafe and its Occupancy (or Use) is Prohibited by the Building Official."~~

~~After posting, occupancy or use of the *unsafe building or structure* shall be prohibited except when authorized to enter to conduct inspections, make required repairs, or as necessary to demolish the *building or structure*.~~

~~**118.5 Posting of notice.** If the notice is unable to be issued by personal service as required by Section 118.4, then the notice shall be sent by~~

registered or certified mail to the last known address of the responsible party and a copy of the notice shall be posted in a conspicuous place on the premises:

118.6 Posting of placard. In the case of an *unsafe building or structure*, if the notice is not complied with, a placard with the following wording shall be posted at the entrance to the *building or structure*:

"This Building (or Structure) is Unfit for Habitation and its Use or Occupancy has been Prohibited by the Building Official."

After an *unsafe building or structure* is placarded, entering the *unsafe building or structure* shall be prohibited except as authorized by the *building official* to make inspections, to perform required repairs, or to demolish the *unsafe building or structure*. In addition, the placard shall not be removed until the *unsafe building or structure* is determined by the *building official* to be safe to occupy. The placard shall not be defaced.

Revise as follows:

118.7 118.4 Emergency repairs and demolition. To the extent permitted by the *locality*, the *building official* may authorize emergency repairs to *unsafe buildings or structures* when or securing the site when it is determined that there is an immediate danger of any portion of the *unsafe building or structure* collapsing or falling and when life is endangered. Emergency repairs may also be authorized when there is a code violation resulting in a serious and imminent threat to the life and safety of the occupants or public. The *building official* shall be permitted to authorize the necessary work to make the *unsafe building or structure* temporarily safe whether or not legal action to compel compliance has been instituted. In addition, whenever an owner of an *unsafe building or structure* fails to comply with a notice to demolish issued under Section 118.4 in the if the notice of violation included an order to demolish the structure and the demolition has not occurred in the time period stipulated, the *building official* shall be permitted to cause the *unsafe building or structure* to be demolished. In accordance with §§ 15.2-906 and 15.2-1115 of the Code of Virginia, the legal counsel of the *locality* may be requested to institute appropriate action against the property owner to recover the costs associated with any such emergency repairs or demolition and every such charge that remains unpaid shall constitute a lien against the property on which the emergency repairs or demolition were made and shall be enforceable in the same manner as provided in Articles 3 (§ 58.1-3940 et seq.) and 4 (§ 58.1-3965 et seq.) of Chapter 39 of Title 58.1 of the Code of Virginia.

Note: *Building officials* and local governing bodies should be aware that other statutes and court decisions may impact on matters relating to demolition, in particular whether newspaper publication is required if the *owner* cannot be located and whether the demolition order must be delayed until the *owner* has been given the opportunity for a hearing.

118.8 118.5 Closing of streets. When necessary for public safety, the *building official* shall be permitted to order the temporary closing of sidewalks, streets, *public ways*, or premises adjacent to *unsafe buildings or structures* and prohibit the use of such spaces: a structure that has become a threat to public safety during construction.

Reason Statement: This section creates a second, VCC, version of "unsafe building or structure", which causes confusion with regards to unsafe building or structure in the VMC. This code change is an attempt to get rid of the third flavor of unsafe structures that is redundant and confusing so the VCC definition is proposed to be deleted since it is not necessary with the proposed format. Section 118.1 establishes that a structure, which becomes a threat to public safety during construction, is a violation of the VCC. Proposed 118.1 sets the condition as a violation and does away with the need for another unsafe structure definition. Section 118.2 addresses issuance of a correction notice for the violation. Section 118.3 addresses issuing an NOV if the correction notice is not complied with and uses existing VCC Section 115 for that purpose. Section 118.4, 118.5 and 118.6 provide a group of provisions for vacating a VCC unsafe structure, though these structures have not received a certificate of occupancy. Any building that is occupied without a CO is in violation of VCC 116.1 and such unlawful occupancy can be addressed through issuing and NOV for the 116.1 violation; therefore, these sections are proposed to be deleted. Renumbered sections 118.4 and 118.5 have been edited to be consistent with the change in terminology.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency
This is editorial.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is editorial.

B202-21

Proponents: Resiliency Sub-Workgroup

2021 International Building Code

Revise as follows:

[BS] BASE FLOOD ELEVATION. The elevation of the *base flood*, including wave height, relative to the National Geodetic Vertical Datum (NGVD), North American Vertical Datum (NAVD) or other datum specified on the *Flood Insurance Rate Map (FIRM)*, and as shown in the *Flood Insurance Study*.

[BS] COASTAL HIGH-HAZARD AREA. Area within the *special flood hazard area* extending from offshore to the inland limit of a ~~primary dune~~ Coastal Primary Sand Dune, as defined by state code (Code of Virginia Title 28.2), along an open coast and any other area that is subject to high-velocity wave action from storms or seismic sources, and shown in either the *Flood Insurance Study*, or on ~~a~~ the *Flood Insurance Rate Map (FIRM)* or other flood hazard map as velocity Zone V, VO, VE or V1-30 (areas subject to wave heights of 3 feet (914.4 mm) or more).

[BS] FLOOD HAZARD AREA. The greater of the following two areas:

1. The area within a flood plain subject to a 1-percent or greater chance of *flooding* in any year (also known as the 100-year floodplain).
2. The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated, including areas in either the *Flood Insurance Study* or on the *Flood Insurance Rate Map (FIRM)* and including areas added to account for future flooding conditions based on the locally adopted sea level rise projected to occur by 2070.

[BS] FLOOD or FLOODING. A general and temporary condition of partial or complete inundation of normally dry land from:

1. ~~The overflow of inland or tidal waves~~ A general and temporary condition of partial or complete inundation of normally dry land from either of the following:
 - 1.1 The overflow of inland or tidal waves
 - 1.2 The unusual and rapid accumulation or runoff of surface waters from any source.
2. ~~The unusual and rapid accumulation or runoff of surface waters from any source.~~ The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in subsection (1.1) of this definition.
3. Mudflows which are proximately caused by flooding as defined in subsection (1.2) of this definition and are akin to a river of liquid and flowing mud on the surface of normally dry land areas, as when earth is carried by a current of water and disposed along the path of the current.

[BS] SPECIAL FLOOD HAZARD AREA. The land area subject to flood hazards and shown on a *Flood Insurance Rate Map* or ~~other flood hazard map~~ the *Flood Insurance Study* as Zone A, AE, A1-30, A99, AR, AO, AH, V, VO, VE or V1-30.

Reason Statement: These code change proposals are being made on behalf of the Resiliency Sub-workgroup. The proposed changes to the definitions are being made to better correlate with the National Flood Insurance Program.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal will neither increase nor decrease the cost of construction.

Resiliency Impact Statement: This proposal will increase Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 Consensus Disapproval

- Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: B202-21

This proposal doesn't have any public comments.

B202(2)-21

Proponents: David Sharp (David.Sharp@fairfaxcounty.gov)

2018 Virginia Construction Code

SECTION 202 DEFINITIONS

Delete without substitution:

~~**PERMIT HOLDER.** The person to whom the permit is issued.~~

Reason Statement: The definition of "Permit Holder" provides little value as it lacks clarity. Moreover, where the term permit holder is found throughout code, its meaning is contextual. Section 108 requires the recording of information on multiple parties in the permit application and issuance process. Information (name and address) is captured for the owner, lessee, applicant, contractors, corporate officers, and the agents of eligible parties (see 108.3 & 108.4). "The person to whom the permit is issued" does not make clear which of the 4 or more parties captured in the permit process is intended by this definition.

Because the term is contextual, it allows Code Officials to properly exercise their discretion in ensuring that the appropriate party is notified as required by the context of a given code provision. Thus, NOVs are issued to the party responsible for violating the code, rather than to the applicant who was present at the time of application. Refunds can be issued to the party who paid the fees for the permit instead of to any of the others who might meet a strict reading of the definition. Inspection results may be conveyed to the contractor and the owner without limitation by a definition.

The definition was added as a companion to changes to section 115.2 in the 2015 code cycle, but it provided little in the way of clarity to resolve the inherent problems with that section's revisions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Deletion is purely administrative.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B202(2)-21

This proposal doesn't have any public comments.

B407.4-21

Proponents: Daniel Willham (daniel.willham@fairfaxcounty.gov)

2021 International Building Code

Revise as follows:

407.4 Means of egress. Group I-2 occupancies shall be provided with *means of egress* complying with Chapter 10 and Sections 407.4.1 through 407.4.4. ~~The fire~~ Fire safety and evacuation plans ~~provided in accordance with Section 1002.2~~ shall be provided in accordance with the *International Fire Code* and shall identify the building components necessary to support a *defend-in-place* emergency response in accordance with Sections 403 and 404 of the International Fire Code.

Reason Statement: Section 1002.2 of the IBC for evacuation plans is deleted in the VCC, so the requirement for these specifically in I-2 occupancies is broken. This change clarifies the reference to a code section that actually exists.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This is a clarification that corrects broken code language and is not a technical change.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency. This change is a clarification and is unrelated to resiliency.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B407.4-21

This proposal doesn't have any public comments.

B432(2)-21

VCC: 432 (New)

Proponents: Shahriar Amiri (samiri@arlingtonva.us)

2018 Virginia Construction Code

Add new text as follows:

432 Energy Storage Systems (ESS). Proponents: Shahriar Amiri (samiri@arlingtonva.us)

3/15/2022

Revision 1: 3/21/2022

2021 Virginia Construction Code

SECTION 432

ELECTRICAL ENERGY STORAGE SYSTEMS (ESS)

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432.1 General. The provisions of this Section shall apply to installation, testing, and of stationary and mobile electrical energy storage systems (ESS).

Exception: ESS in Group R-3 and R-4 occupancies shall comply with Section 432.11.

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432.1.1 Scope. ESS having capacities exceeding the values shown in Table 432.1.1 shall comply with this section.

TABLE 432.1.1 ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES

<u>TECHNOLOGY</u>	<u>ENERGY CAPACITY^a</u>
<u>Capacitor ESS</u>	<u>3 kWh</u>
<u>Flow batteries^b</u>	<u>20 kWh</u>
<u>Lead-acid batteries, all types</u>	<u>70 kWh^c</u>
<u>Lithium-ion batteries</u>	<u>20 kWh</u>
<u>Nickel metal hydride (Ni-MH)</u>	<u>70 kWh</u>
<u>Nickel-cadmium batteries (Ni-Cd)</u>	<u>70 kWh</u>
<u>Other battery technologies</u>	<u>10 kWh</u>
<u>Other electrochemical ESS technologies</u>	<u>3 kWh</u>

For SI: 1 kilowatt hour = 3.6 megajoules.

a. Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. For units rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

c. Fifty gallons of lead-acid battery electrolyte shall be considered equivalent to 70 kWh.

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432.1.2 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the ESS is to be installed.
2. Details on the hourly *fire-resistance ratings* of assemblies enclosing the ESS.
3. The quantities and types of ESS to be installed.
4. Manufacturer's specifications, ratings and listings of each ESS.
5. Description of energy (battery) management systems and their operation.
6. Location and content of required signage.
7. Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and *deflagration* venting systems, if provided.
8. Support arrangement associated with the installation, including any required seismic restraint.
9. A commissioning plan complying with Section 432.2.1.
10. A decommissioning plan complying with Section 432.2.3.

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432.1.3 Hazard mitigation analysis. A failure modes and effects analysis (FMEA) or other *approved* hazard mitigation analysis shall be provided in accordance with Section 104.8.2 under any of the following conditions:

1. Where ESS technologies not specifically identified in Table 432.1.1 are provided.
2. More than one ESS technology is provided in a room or enclosed area where there is a potential for adverse interaction between technologies.
3. Where allowed as a basis for increasing maximum allowable quantities. See Section 432.5.2.

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432.1.3.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes. Only single failure modes shall be considered.

1. A thermal runaway condition in a single ESS rack, module or unit.
2. Failure of any battery (energy) management system.
3. Failure of any required ventilation or exhaust system.
4. Voltage surges on the primary electric supply.
5. Short circuits on the load side of the ESS.
6. Failure of the smoke detection, fire detection, fire suppression or gas detection system.
7. Required spill neutralization not being provided or failure of a required secondary containment system.

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432.1.3.2 Analysis approval. The *code official* is authorized to approve the hazardous mitigation analysis provided that the consequences of the hazard mitigation analysis demonstrate:

1. Fires will be contained within unoccupied ESS rooms or areas for the minimum duration of the fire-resistance-rated separations identified in Section 432.7.4.
2. Fires in occupied work centers will be detected in time to allow occupants within the room or area to safely evacuate.
3. Toxic and highly toxic gases released during fires will not reach concentrations in excess of the IDLH level in the building or adjacent *means of egress* routes during the time deemed necessary to evacuate occupants from any affected area.
4. Flammable gases released from ESS during charging, discharging and normal operation will not exceed 25 percent of their lower flammability limit (LFL).
5. Flammable gases released from ESS during fire, overcharging and other abnormal conditions will be controlled through the use of ventilation of the gases, preventing accumulation, or by *deflagration* venting.

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432.1.4 Large-scale fire test. Where required elsewhere in Section 432, large-scale fire testing shall be conducted on a representative ESS in accordance with UL 9540A. The testing shall be conducted or witnessed and reported by an *approved* testing laboratory and show that a fire involving one ESS will not propagate to an adjacent ESS, and where installed within buildings, enclosed areas and walk-in units will be contained within the room, enclosed area or walk-in unit for a duration equal to the *fire-resistance rating* of the room separation specified in Section 432.7.4. The test report shall be provided to the *code official* for review and approval in accordance with Section 104.8.2.

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432.2 Commissioning shall be conducted in accordance with this section.

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432.2.1 Commissioning. Commissioning of newly installed ESS shall be subject to *special inspection* and conducted prior to the ESS being placed in service in accordance with a commissioning plan that has been *approved* prior to initiating commissioning. The commissioning plan shall include the following:

1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities.
2. A listing of the specific ESS and associated components, controls and safety-related devices to be tested, a description of the tests to be performed and the functions to be tested.
3. Conditions under which all testing will be performed, which are representative of the conditions during normal operation of the system.
4. Documentation of the owner's project requirements and the basis of design necessary to understand the installation and operation of the ESS.
5. Verification that required equipment and systems are installed in accordance with the *approved* plans and specifications.
6. Integrated testing for all fire and safety systems.
7. Testing for any required thermal management, ventilation or exhaust systems associated with the ESS installation.
8. Preparation and delivery of operation and maintenance documentation.
9. Training of facility operating and maintenance staff.
10. Identification and documentation of the requirements for maintaining system performance to meet the original design intent during the operation phase.
11. Identification and documentation of personnel who are qualified to service, maintain and decommission the ESS, and respond to incidents involving the ESS, including documentation that such service has been contracted for.
12. A decommissioning plan for removing the ESS from service, and from the facility in which it is located. The plan shall include details on providing a safe, orderly shutdown of energy storage and safety systems with notification to the code officials prior to the actual decommissioning of the system. The decommissioning plan shall include contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event.

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Exception: Commissioning shall not be required for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC. A decommissioning plan shall be provided and maintained where required by the *code official*.

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432.2.1.1 Initial acceptance testing. During the commissioning process an ESS shall be evaluated for proper operation in accordance with the manufacturer's instructions and the commissioning plan prior to final approval.

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432.2.1.2 Commissioning report. A report describing the results of the system commissioning, including the results of the initial acceptance testing required in Section 432.2.1.1, shall be provided to the *code official* prior to final inspection and approval and maintained at an *approved* on-site location.

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432.2.3 Decommissioning. Decommissioning shall be performed in accordance with the decommissioning plan that includes the following:

1. A narrative description of the activities to be accomplished for removing the ESS from service, and from the facility in which it is located.
2. A listing of any contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event.

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432.3 Equipment. ESS equipment shall be in accordance conform with to Sections 432.3.1 through 432.3.9.

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432.3.1 Energy storage system listings. ESS shall be *listed* in accordance with UL 9540.

Exception: Lead-acid and nickel-cadmium battery systems installed in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76, are not required to be *listed*.

-

432.3.2 Equipment listing. Chargers, inverters and energy storage management systems shall be covered as part of the UL 9540 listing or shall be *listed* separately.

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432.3.3 Utility interactive systems. Inverters shall be *listed* and *labeled* in accordance with UL 1741. Only inverters *listed* and *labeled* for utility interactive system use and identified as interactive shall be allowed to operate in parallel with the electric utility power system to supply power to common loads.

-

432.3.4 Energy storage management system. Where required by the ESS listing, an *approved* energy storage management system that monitors and balances cell voltages, currents and temperatures within the manufacturer's specifications shall be provided. The system shall disconnect electrical connections to the ESS or otherwise place it in a safe condition if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.

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432.3.5 Enclosures. Enclosures of ESS shall be of noncombustible construction.

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432.4 General installations requirements. Stationary and mobile ESS shall comply with the requirements of Sections 432.4.1 through 432.4.12.

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432.4.1 Electrical disconnects. Where the ESS disconnecting means is not within sight of the main electrical service disconnecting means, placards or directories shall be installed at the location of the main electrical service disconnecting means indicating the location of stationary storage battery system disconnecting means in accordance with NFPA 70.

Exception: Electrical disconnects for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC shall be permitted to have electrical disconnects signage in accordance with NFPA 76.

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432.4.2 Working clearances. Access and working space shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment in accordance with NFPA 70 and the manufacturer's instructions.

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432.4.3 Fire-resistance-rated separations. Rooms and other indoor areas containing ESS shall be separated from other areas of the building in accordance with Section 432.7.4. ESS shall be permitted to be in the same room with the equipment they support.

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432.4.4 Seismic and structural design. Stationary ESS shall comply with the seismic design requirements in Chapter 16 , and shall not exceed the floor loading limitation of the building.

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432.4.5 Vehicle impact protection. Where ESS are subject to impact by a motor vehicle, including forklifts, vehicle impact protection shall be provided in accordance with Section 312 of the International Fire Code.

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432.4.6 Combustible storage. Combustible materials shall not be stored in ESS rooms, areas or walk-in units. Combustible materials in occupied work centers covered by Section 432.4.10 shall be stored at least 3 feet (914 mm) from ESS cabinets.

-
432.4.7 Toxic and highly toxic gases. ESS that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall be provided with a hazardous exhaust system in accordance with Section 502.8 of the *International Mechanical Code* .

432.4.8 Signage. Approved signs shall be provided on or adjacent to all entry doors for ESS rooms or areas and on enclosures of ESS cabinets and walk-in units located outdoors, on rooftops or in open parking garages. Signs designed to meet both the requirements of this section and NFPA 70 shall be permitted. The signage shall include the following or equivalent:

1. "ENERGY STORAGE SYSTEM," "BATTERY STORAGE SYSTEM," "CAPACITOR ENERGY STORAGE SYSTEM" or the equivalent.

2. The identification of the electrochemical ESS technology present.

3. "ENERGIZED ELECTRICAL CIRCUITS."

4. Where water-reactive electrochemical ESS are present, the signage shall include "APPLY NO WATER."

5. Current contact information, including phone number, for personnel authorized to service the equipment and for fire mitigation personnel required by Section 432.1.6.1.

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432.4.9 Security of installations. Rooms, areas and walk-in units in which electrochemical ESS are located shall be secured against unauthorized entry and safeguarded in an approved manner. Security barriers, fences, landscaping and other enclosures shall not inhibit the required air flow to or exhaust from the electrochemical ESS and its components.

432.4.10 Occupied work centers. Electrochemical ESS located in rooms or areas occupied by personnel not directly involved with maintenance, service and testing of the systems shall comply with the following:

1. Electrochemical ESS located in occupied work centers shall be housed in locked noncombustible cabinets or other enclosures to prevent access by unauthorized personnel.
2. Where electrochemical ESS are contained in cabinets in occupied work centers, the cabinets shall be located within 10 feet (3048 mm) of the equipment that they support.
3. Cabinets shall include signage complying with Section 432.4.8.

432.4.11 Open rack installations. Where electrochemical ESS are installed in a separate equipment room and only authorized personnel have access to the room, they shall be permitted to be installed on an open rack for ease of maintenance.

432.4.12 Walk-in units. Walk-in units shall be entered only for inspection, maintenance and repair of ESS units and ancillary equipment, and shall not be occupied for other purposes.

432.5 Electrochemical ESS protection. The protection of electrochemical ESS shall be in accordance with Sections 432.5.1 through 432.5.8 where required by Sections 432.7 through 432.10.

TABLE 432.5 MAXIMUM ALLOWABLE QUANTITIES OF ELECTROCHEMICAL ESS

<u>TECHNOLOGY</u>	<u>MAXIMUM ALLOWABLE QUANTITIES^a</u>
<u>STORAGE BATTERIES</u>	
<u>Flow batteries^b</u>	<u>600 kWh</u>
<u>Lead-acid, all types</u>	<u>Unlimited</u>
<u>Lithium-ion</u>	<u>600 kWh</u>
<u>Nickel metal hydride (Ni-MH)</u>	<u>Unlimited</u>
<u>Nickel-cadmium (Ni-Cd)</u>	<u>Unlimited</u>
<u>Other battery technologies</u>	<u>200 kWh</u>
<u>CAPACITORS</u>	
<u>All types</u>	<u>20 kWh</u>
<u>OTHER ELECTROCHEMICAL ESS</u>	
<u>All types</u>	<u>20 kWh</u>

For SI: 1 kilowatt hour = 3.6 megajoules.

a. For electrochemical ESS units rated in amp-hours, kWh shall equal rated voltage times the amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

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432.5.1 Size and separation. Electrochemical ESS shall be segregated into groups not exceeding 50 kWh (180 megajoules). Each group shall be separated a minimum of 3 feet (914 mm) from other groups and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

1. Lead-acid and nickel-cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.

2. The code official is authorized to approve larger capacities or smaller separation distances based on large-scale fire testing complying with Section 432.1.5.

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432.5.2 Maximum allowable quantities. Fire areas within rooms, areas and walk-in units containing electrochemical ESS shall not exceed the maximum allowable quantities in Table 432.5.

Exceptions:

-

1. Where approved by the code official, rooms, areas and walk-in units containing electrochemical ESS that exceed the amounts in Table 432.5 shall be permitted based on a hazardous mitigation analysis in accordance with Section 432.1.4 and large-scale fire testing complying with Section 432.1.5.

2. Lead-acid and nickel-cadmium battery systems installed in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.

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3. Dedicated-use buildings in compliance with Section 432.7.1.

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432.5.2.1 Mixed electrochemical energy systems. Where rooms, areas and walk-in units contain different types of electrochemical energy technologies, the total aggregate quantities of the systems shall be determined based on the sum of percentages of each technology-type quantity divided by the maximum allowable quantity of each technology type. The sum of the percentages shall not exceed 100 percent of the maximum allowable quantity.

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432.5.3 Elevation. Electrochemical ESS shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

2. Where the floor is located below the lowest level of exit discharge.

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Exceptions:

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1. Lead-acid and nickel-cadmium battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.

2. Where *approved*, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.

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432.5.4 Fire detection. An *approved* automatic smoke detection system or radiant energy-sensing fire detection system complying with Section 907.2 shall be installed in rooms, indoor areas and walk-in units containing electrochemical ESS. An *approved* radiant energy-sensing fire detection system shall be installed to protect open parking garage and rooftop installations. Alarm signals from detection systems shall be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or where *approved* to a constantly attended location.

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432.5.4.1 System status. Where required by the *code official*, visible annunciation shall be provided on cabinet exteriors or in other *approved* locations to indicate that potentially hazardous conditions associated with the ESS exist.

-

432.5.5 Fire suppression systems. Rooms and areas within buildings and walk-in units containing electrochemical ESS shall be protected by an automatic fire suppression system designed and installed in accordance with one of the following:

1. An *automatic sprinkler system* designed and installed in accordance with Section 903.3.1.1 with a minimum density of 0.3 gpm/ft² (1.14 L/min) based on the *fire area* or 2,500 square-foot (232 m²) design area, whichever is smaller.

2. Where *approved*, an *automatic sprinkler system* designed and installed in accordance with Section 903.3.1.1 with a sprinkler hazard classification based on large-scale fire testing complying with Section 432.1.5.

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Exception: Fire suppression systems for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that operate at less than 50 VAC and 60 VDC shall be provided where required by NFPA 76.

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432.5.5.1 Water-reactive systems. Electrochemical ESS that utilize water-reactive materials shall be protected by an *approved* alternative automatic fire-extinguishing system in accordance with Section 904, where the installation is *approved* by the *code official* based on large-scale fire testing complying with Section 432.1.5.

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432.5.6 Maximum enclosure size. Outdoor walk-in units housing ESS shall not exceed 53 feet by 8 feet by 9.5 feet high (16 154 mm x 2438 mm x 2896 mm), not including bolt-on HVAC and related equipment, as *approved*. Outdoor walk-in units exceeding these limitations shall be considered indoor installations and comply with the requirements in Section 432.7.

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432.5.7 Vegetation control. Areas within 10 feet (3048 mm) on each side of outdoor ESS shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees, shrubbery or cultivated ground cover such as green grass, ivy, succulents or similar plants used as ground cover shall be permitted to be exempt provided that they do not form a means of readily transmitting fire.

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432.5.8 Means of egress separation. ESS located outdoors and in open parking garages shall be separated from any *means of egress* as required by the *code official* to ensure safe egress under fire conditions, but in no case less than 10 feet (3048 mm).

Exception: The *code official* is authorized to approve a reduced separation distance if large-scale fire testing complying with Section 432.1.5 is provided that shows that a fire involving the ESS will not adversely impact occupant egress.

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432.6 Electrochemical ESS technology-specific protection. Electrochemical ESS installations shall comply with the requirements of this section in accordance with the applicable requirements of Table 432.6.

TABLE 432.6 ELECTROCHEMICAL ESS TECHNOLOGY-SPECIFIC REQUIREMENTS

COMPLIANCE REQUIRED ^b		BATTERY TECHNOLOGY				OTHER ESS AND BATTERY TECHNOLOGIES ^b	CAPACITOR ESS ^b
Feature	Section	Lead-acid	Ni-Cd and Ni-MH	Lithium-ion	Flow		
Exhaust ventilation	432.6.1	Yes	Yes	No	Yes	Yes	Yes
Explosion control	432.6.3	Yes ^a	Yes ^a	Yes	No	Yes	Yes
Safety caps	432.6.4	Yes	Yes	No	No	Yes	Yes
Spill control and neutralization	-	Yes ^c	Yes ^c	-	-	-	-
	432.6.2			No	Yes	Yes	Yes
Thermal runaway	432.6.5	Yes ^d	Yes	Yes ^e	No	Yes ^e	Yes

a. Not required for lead-acid and nickel-cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

b. Protection shall be provided unless documentation acceptable to the code official is provided in accordance with Section 104.8.2 that provides justification why the protection is not necessary based on the technology used.

c. Applicable to vented-type (i.e., flooded) nickel-cadmium and lead-acid batteries.

d. Not required for vented-type (i.e., flooded) lead-acid batteries.

e. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

432.6.1 Exhaust ventilation. Where required by Table 432.6 or elsewhere in this code, exhaust ventilation of rooms, areas and walk-in units containing electrochemical ESS shall be provided in accordance with the *International Mechanical Code* and Section 432.6.1.1 or 432.6.1.2.

432.6.1.1 Ventilation based on LFL. The exhaust ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammable limit (LFL) of the total volume of the room, area or walk-in unit during the worst-case event of simultaneous charging of batteries at the maximum charge rate, in accordance with nationally recognized standards.

432.6.1.2 Ventilation based on exhaust rate. Mechanical exhaust ventilation shall be provided at a rate of not less than 1 ft³/min/ft² (5.1 L/sec/m²) of floor area of the room, area or walk-in unit. The ventilation shall be either continuous or shall be activated by a gas detection system in accordance with Section 432.6.1.2.4.

432.6.1.2.1 Standby power. Mechanical exhaust ventilation shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.5 of the *International Fire Code*.

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432.6.1.2.2 Installation instructions. Required mechanical exhaust ventilation systems shall be installed in accordance with the manufacturer's installation instructions and the *International Mechanical Code*.

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432.6.1.2.3 Supervision. Required mechanical exhaust ventilation systems shall be supervised by an *approved* central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible signal at an *approved* constantly attended on-site location.

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432.6.1.2.4 Gas detection system. Where required by Section 432.6.1.2, rooms, areas and walk-in units containing ESS shall be protected by an *approved* continuous gas detection system that complies with Section 916 and with the following:

1. The gas detection system shall be designed to activate the mechanical ventilation system when the level of flammable gas in the room, area or walk-in unit exceeds 25 percent of the LFL.

2. The mechanical ventilation system shall remain on until the flammable gas detected is less than 25 percent of the LFL.

3. The gas detection system shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.5. of the *International Fire Code*.

4. Failure of the gas detection system shall annunciate a trouble signal at an *approved* central station, proprietary or remote station service in accordance with NFPA 72 or shall initiate an audible and visible trouble signal at an *approved* constantly attended on-site location.

432.6.2 Spill control and neutralization. Where required by Table 432.6 or elsewhere in this code, areas containing free-flowing liquid electrolyte or hazardous materials shall be provided with spill control and neutralization in accordance with this section.

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432.6.2.1 Spill control. Spill control shall be provided to prevent the flow of liquid electrolyte or hazardous materials to adjoining rooms or areas. The method shall be capable of containing a spill from the single largest battery or vessel.

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432.6.2.2 Neutralization. An *approved* method that is capable of neutralizing spilled liquid electrolyte from the largest battery or vessel to a pH between 5.0 and 9.0 shall be provided.

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432.6.2.3 Communications utilities. The requirements of Section 432.6.2 shall apply only when the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L) for lead-acid and nickel-cadmium battery systems operating at less than 50 VAC and 60 VDC that are located at facilities under the exclusive control of communications utilities, and those facilities comply with NFPA 76 in addition to applicable requirements of this code.

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432.6.3 Explosion control. Where required by Table 432.6 or elsewhere in this code, explosion control complying with Section 911 of IFC shall be provided for rooms, areas or walk-in units containing electrochemical ESS technologies.

Exceptions:

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1. Where *approved*, explosion control is permitted to be waived by the *code official* based on large-scale fire testing complying with Section 432.1.5 that demonstrates that flammable gases are not liberated from electrochemical ESS cells or modules where tested in accordance with UL 9540A.

2. Where *approved*, explosion control is permitted to be waived by the *code official* based on documentation provided that demonstrates that the electrochemical ESS technology to be used does not have the potential to release flammable gas concentrations in excess of 25 percent of the LFL anywhere in the room, area, walk-in unit or structure under thermal runaway or other fault conditions.

432.6.4 Safety caps. Where required by Table 432.6 or elsewhere in this code, vented batteries and other ESS shall be provided with flame-arresting safety caps.

432.6.5 Thermal runaway. Where required by Table 432.6 or elsewhere in this code, batteries and other ESS shall be provided with a *listed* device or other *approved* method to prevent, detect and minimize the impact of thermal runaway.

432.7 Indoor installations. Indoor ESS installations shall be in accordance with Sections 432.7.1 through 432.7.4.

TABLE 432.7 INDOOR ESS INSTALLATIONS

COMPLIANCE REQUIRED		-	-
Feature	Section	DEDICATED-USE BUILDINGS ^a	NONDEDICATED-USE BUILDINGS ^b
Dwelling units and sleeping units	432.7.3	NA	Yes
Elevation	432.5.3	Yes	Yes
Fire suppression systems	432.5.5	Yes ^c	Yes
Fire-resistance-rated separations	432.7.4	Yes	Yes
General installation requirements	432.4	Yes	Yes
Maximum allowable quantities	432.5.2	No	Yes
Size and separation	432.5.1	Yes	Yes
Smoke and automatic fire detection ^e	432.5.4	Yes ^d	Yes
Technology specific protection	432.6	Yes	Yes

NA = Not Allowed.

a. See Section 432.7.1.

b. See Section 432.7.2.

c. Where approved by the code official, fire suppression systems are permitted to be omitted in dedicated-use buildings located more than 100 feet (30.5 m) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high-piled stock and other exposure hazards.

d. Where approved by the code official, alarm signals are not required to be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or a constantly attended location where local fire alarm annunciation is provided and trained personnel are always present.

e. Lead-acid and nickel-cadmium battery systems installed in Group U buildings and structures less than 1,500 square feet (139 m²) under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76, are not required to have an approved automatic smoke or fire detection system.

432.7.1 Dedicated-use buildings. For the purpose of Table 432.7, dedicated-use ESS buildings shall be classified as Group F-1 occupancies and comply with all the following:

1. The building shall only be used for ESS, electrical energy generation and other electrical grid-related operations.

2. Occupants in the rooms and areas containing ESS are limited to personnel that operate, maintain, service, test and repair the ESS and other energy systems.

3. No other occupancy types shall be permitted in the building.

4. Administrative and support personnel shall be permitted in areas within the buildings that do not contain ESS, provided that:

4.1. The areas do not occupy more than 10 percent of the *building area* of the story in which they are located.

4.2. A *means of egress* is provided from the incidental use areas to the *public way* that does not require occupants to traverse through areas containing ESS or other energy system equipment.

432.7.2 Nondedicated-use buildings. For the purpose of Table 432.7, nondedicated-use buildings include all buildings that contain ESS and do not comply with Section 432.7.1 dedicated-use building requirements.

432.7.3 Dwelling units and sleeping units. ESS shall not be installed in *sleeping units* or in *habitable spaces of dwelling units*.

432.7.4 Fire-resistance-rated separations. Rooms and areas containing ESS shall include *fire-resistance-rated* separations as follows:

1. In dedicated-use buildings, rooms and areas containing ESS shall be separated from areas in which administrative and support personnel are located.

2. In nondedicated-use buildings, rooms and areas containing ESS shall be separated from other areas in the building.

Separation shall be provided by 2-hour *firebarriers* and 2-hour *horizontal assemblies*, as appropriate.

432.8 Outdoor installations. Outdoor installations shall be in accordance with Sections 432.8.1 through 432.8.3. Exterior wall installations for individual ESS units not exceeding 20 kWh shall be in accordance with Section 432.8.4.

TABLE 432.8 OUTDOOR ESS INSTALLATIONS^a

COMPLIANCE REQUIRED		-	-
Feature	Section	REMOTE INSTALLATIONS ^a	INSTALLATIONS NEAR EXPOSURES ^b
All ESS installations	432.4	Yes	Yes
Clearance to exposures	432.8.3	Yes	Yes
Fire suppression systems	432.5.5	Yes ^c	Yes
Maximum allowable quantities	432.5.2	No	Yes

<u>Maximum enclosure size</u>	<u>432.5.6</u>	<u>Yes</u>	<u>Yes</u>
<u>Means of egress separation</u>	<u>432.5.8</u>	<u>Yes</u>	<u>Yes</u>
<u>Size and separation</u>	<u>432.5.1</u>	<u>No</u>	<u>Yes^d</u>
<u>Smoke and automatic fire detection</u>	<u>432.5.4</u>	<u>Yes</u>	<u>Yes</u>
<u>Technology-specific protection</u>	<u>432.6</u>	<u>Yes</u>	<u>Yes</u>
<u>Vegetation control</u>	<u>432.5.7</u>	<u>Yes</u>	<u>Yes</u>

a. See Section 432.8.1.

b. See Section 432.8.2.

c. Where approved by the code official, fire suppression systems are permitted to be omitted.

d. In outdoor walk-in units, spacing is not required between ESS units and the walls of the enclosure.

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432.8.1 Remote outdoor installations. For the purpose of Table 432.8, remote outdoor installations include ESS located more than 100 feet (30 480 mm) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high-piled stock and other exposure hazards.

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432.8.2 Installations near exposures. For the purpose of Table 432.8, installations near exposures include all outdoor ESS installations that do not comply with Section 432.8.1 remote outdoor location requirements.

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432.8.3 Clearance to exposures. ESS located outdoors shall be separated by a minimum of 10 feet (3048 mm) from the following exposures:

1. Lot lines.

2. Public ways.

3. Buildings.

4. Stored combustible materials.

5. Hazardous materials.

6. High-piled stock.

7. Other exposure hazards.

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Exceptions:

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1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1-hour *fire-resistance-rated construction* suitable for exterior use and extending 5 feet (1524 mm) above and 5 feet (1524 mm) beyond the physical boundary of the ESS installation is provided to protect the exposure.

2. Clearances to buildings are permitted to be reduced to 3 feet (914 mm) where noncombustible exterior walls with no openings or combustible overhangs are provided on the wall adjacent to the ESS and the *fire-resistance rating* of the exterior wall is a minimum of 2 hours.

3. Clearances to buildings are permitted to be reduced to 3 feet (914 mm) where a weatherproof enclosure constructed of noncombustible

materials is provided over the ESS, and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large-scale fire testing complying with Section 432.1.5.

432.8.4 Exterior wall installations. ESS shall be permitted to be installed outdoors on exterior walls of buildings when all of the following conditions are met:

1. The maximum energy capacity of individual ESS units shall not exceed 20 kWh.
2. The ESS shall comply with applicable requirements in Section 432.
3. The ESS shall be installed in accordance with the manufacturer's instructions and their listing.
4. Individual ESS units shall be separated from each other by at least 3 feet (914 mm).
5. The ESS shall be separated from doors, windows, operable openings into buildings or HVAC inlets by at least 5 feet (1524 mm).

Exception: Where *approved*, smaller separation distances in Items 4 and 5 shall be permitted based on large-scale fire testing complying with Section 432.1.5.

432.9 Special installations. Rooftop and open parking garage ESS installations shall comply with Sections 432.9.1 through 432.9.6.

TABLE 432.9 SPECIAL ESS INSTALLATIONS

COMPLIANCE REQUIRED			
Feature	Section	ROOFTOPS ^a	OPEN PARKING GARAGES ^b
All ESS installations	432.4	Yes	Yes
Clearance to exposures	432.9.3	Yes	Yes
Fire suppression systems	432.9.4	Yes	Yes
Maximum allowable quantities	432.5.2	Yes	Yes
Maximum enclosure size	432.5.6	Yes	Yes
Means of egress separation	432.5.8	Yes	Yes
Open parking garage installations	432.9.6	No	Yes
Rooftop installations	432.9.5	Yes	No
Size and separation	432.5.1	Yes	Yes
Smoke and automatic fire detection	432.5.4	Yes	Yes
Technology-specific protection	432.6	Yes	Yes

a. See Section 432.9.1.

b. See Section 432.9.2.

432.9.1 Rooftop installations. For the purpose of Table 432.9, rooftop ESS installations are those located on the roofs of buildings.

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432.9.2 Open parking garage installations. For the purpose of Table 432.9, open parking garage ESS installations are those located in a structure or portion of a structure that complies with Section 406.5.

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432.9.3 Clearance to exposures. ESS located on rooftops and in open parking garages shall be separated by a minimum of 10 feet (3048 mm) from the following exposures:

1. Buildings, except the building on which rooftop ESS is mounted.
2. Any portion of the building on which a rooftop system is mounted that is elevated above the rooftop on which the system is installed.
3. Lot lines.
4. Public ways.
5. Stored combustible materials.
6. Locations where motor vehicles can be parked.
7. Hazardous materials.
8. Other exposure hazards.

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Exceptions:

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1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1-hour fire-resistance-rated construction suitable for exterior use and extending 5 feet (1524 mm) above and 5 feet (1524 mm) beyond the physical boundary of the ESS installation is provided to protect the exposure.

2. Clearances are permitted to be reduced to 3 feet (914 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the ESS, and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large-scale fire testing complying with Section 432.1.5.

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432.9.4 Fire suppression systems. ESS located in walk-in units on rooftops or in walk-in units in open parking garages shall be provided with automatic fire suppression systems within the ESS enclosure in accordance with Section 432.5.5. Areas containing ESS other than walk-in units in open parking structures on levels not open above to the sky shall be provided with an automatic fire suppression system complying with Section 432.5.5.

Exception: A fire suppression system is not required in open parking garages if large-scale fire testing complying with Section 432.1.5 is provided that shows that a fire will not impact the exposures in Section 432.9.3.

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432.9.5 Rooftop installations. ESS and associated equipment that are located on rooftops and not enclosed by building construction shall comply with the following:

1. Stairway access to the roof for emergency response and fire department personnel shall be provided.

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2. Service walkways at least 5 feet (1524 mm) in width shall be provided for service and emergency personnel from the point of access to the roof to the system.
3. ESS and associated equipment shall be located from the edge of the roof a distance equal to at least the height of the system, equipment or component but not less than 5 feet (1524 mm).
4. The roofing materials under and within 5 feet (1524 mm) horizontally from an ESS or associated equipment shall be noncombustible or shall have a Class A rating when tested in accordance with ASTM E108 or UL 790.
5. A Class I standpipe outlet shall be installed at an *approved* location on the roof level of the building or in the stairway at the top level.
6. The ESS shall be the minimum of 10 feet (3048 mm) from the fire service access point on the rooftop.

432.9.6 Open parking garages. ESS and associated equipment that are located in open parking garages shall comply with all of the following:

1. ESS shall not be located within 50 feet (15 240 mm) of air inlets for building HVAC systems.

Exception: This distance shall be permitted to be reduced to 25 feet (7620 mm) if the automatic fire alarm system monitoring the radiant- energy sensing detectors de-energizes the ventilation system connected to the air intakes upon detection of fire.

2. ESS shall not be located within 25 feet (7620 mm) of *exits* leading from the attached building where located on a covered level of the parking structure not directly open to the sky above.
3. An *approved* fence with a locked gate or other *approved* barrier shall be provided to keep the general public at least 5 feet (1524 mm) from the outer enclosure of the ESS.

432.10 Mobile ESS equipment and operations. Mobile ESS equipment shall comply with Sections 432.10.1 through 432.10.7.7.

TABLE 432.10 MOBILE ENERGY STORAGE SYSTEMS (ESS)

COMPLIANCE REQUIRED		DEPLOYMENT ^a
Feature	Section	
All ESS installations	432.4	Yes ^b
Fire suppression systems	432.5.5	Yes ^c
Maximum allowable quantities	432.5.2	Yes
Maximum enclosure size	432.5.6	Yes
Means of egress separation	432.5.8	Yes
Size and separation	432.5.1	Yes ^d
Smoke and automatic fire detection	432.5.4	Yes ^e
Technology-specific protection	432.6	Yes
Vegetation control	432.5.7	Yes

a. See Section 432.10.2.

b. Mobile operations on wheeled vehicles and trailers shall not be required to comply with Section 432.4.4 seismic and structural load requirements.

c. Fire suppression system connections to the water supply shall be permitted to use approved temporary connections.

d. In walk-in units, spacing is not required between ESS units and the walls of the enclosure.

e. Alarm signals are not required to be transmitted to an approved location for mobile ESS deployed 30 days or less.

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432.10.1 Charging and storage. For the purpose of Section 432.10, charging and storage covers the operation where mobile ESS are charged and stored so they are ready for deployment to another site, and where they are charged and stored after a deployment.

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432.10.2 Deployment. For the purpose of Section 432.10, deployment covers operations where mobile ESS are located at a site other than the charging and storage site and are being used to provide power.

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432.10.3 Permits. Construction permits shall be provided for charging and storage of mobile ESS.

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432.10.4 Construction documents. Construction documents complying with Section 432.1.3 shall be provided with the construction permit application for mobile ESS charging and storage locations.

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432.10.4.1 Deployment documents. The following information shall be provided with the permit applications for mobile ESS deployments:

1. Relevant information for the mobile ESS equipment and protection measures in the construction documents required by Section 432.1.3.

2. Location and layout diagram of the area in which the mobile ESS is to be deployed, including a scale diagram of all nearby exposures.

3. Location and content of signage, including no smoking signs.

4. Description of fencing to be provided around the ESS, including locking methods.

5. Details on fire suppression, smoke and automatic fire detection, system monitoring, thermal management, exhaust ventilation and explosion control, if provided.

6. For deployment, the intended duration of operation, including anticipated connection and disconnection times and dates.

7. Location and description of local staging stops during transit to the deployment site. See Section 432.10.7.5.

8. Description of the temporary wiring, including connection methods, conductor type and size, and circuit overcurrent protection to be provided.

9. Description of how fire suppression system connections to water supplies or extinguishing agents are to be provided.

10. Contact information for personnel who are responsible for maintaining and servicing the equipment and responding to emergencies as required by Section 432.1.6.1.

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432.10.5 Approved locations. Locations where mobile ESS are charged, stored and deployed shall be restricted to the locations established on the construction permits.

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432.10.6 Charging and storage. Installations where mobile ESS are charged and stored shall be treated as permanent ESS indoor or outdoor installations, and shall comply with the following sections, as applicable:

1. Indoor charging and storage shall comply with Section 432.7.
2. Outdoor charging and storage shall comply with Section 432.8.
3. Charging and storage on rooftops and in open parking garages shall comply with Section 432.9.

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Exceptions:

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1. Electrical connections shall be permitted to be made using temporary wiring complying with the manufacturer's instructions, the UL 9540 listing and NFPA 70.
2. Fire suppression system connections to the water supply shall be permitted to use *approved* temporary connections.

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432.10.7 Deployed mobile ESS requirements. Deployed mobile ESS equipment shall comply with this section and Table 432.10.

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432.10.7.1 Duration. The duration of mobile ESS deployment shall not exceed 30 days.

Exceptions:

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1. Mobile ESS deployments that provide power for durations longer than 30 days shall comply with Section 432.10.6.
2. Mobile ESS deployments shall not exceed 180 days unless additional permits are obtained.

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432.10.7.2 Restricted locations. Deployed mobile ESS operations shall not be located indoors, in covered parking garages, on rooftops, below grade or under building overhangs.

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432.10.7.3 Clearance to exposures. Deployed mobile ESS shall be separated by a minimum of 10 feet (3048 mm) from the following exposures:

1. Public ways.
2. Buildings.
3. Stored combustible materials.
4. Hazardous materials.
5. High-piled storage.
6. Other exposure hazards.

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Deployed mobile ESS shall be separated by a minimum of 50 feet (15 240 mm) from public seating areas and from tents, canopies and membrane structures with an *occupant load* of 30 or more.

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432.10.7.4 Electrical connections. Electrical connections shall be made in accordance with the manufacturer's instructions and the UL 9540 listing. Temporary wiring for electrical power connections shall comply with NFPA 70. Fixed electrical wiring shall not be provided.

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432.10.7.5 Fencing. An *approved fence* with a locked gate or other *approved barrier* shall be provided to keep the general public at least 5 feet (1524 mm) from the outer enclosure of a deployed mobile ESS.

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432.10.7.6 Smoking. Smoking shall be prohibited within 10 feet (3048 mm) of mobile ESS. Signs shall be posted in accordance with Section 310 of IFC.

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432.11 ESS in Group R-3, and R-4, occupancies. ESS in Group R-3, and R-4 occupancies shall be installed and maintained in accordance with Sections 432.11.1 through 432.11.9. The temporary use of an *owner* or *occupant's* electric-powered vehicle as an ESS shall be in accordance with Section 432.11.10.

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432.11.1 Equipment listings. ESS shall be *listed* and *labeled* in accordance with UL 9540. ESS *listed* and *labeled* solely for utility or commercial use shall not be used for residential applications.

Exceptions:

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_____ ESS less than 1 kWh (3.6 megajoules).
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432.11.2 Installation. ESS shall be installed in accordance with the manufacturer's instructions and their listing.

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432.11.2.1 Spacing. Individual units shall be separated from each other by at least 3 feet (914 mm) of spacing unless smaller separation distances are documented to be adequate based on large-scale fire testing complying with Section 432.1.5.

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432.11.3 Location. ESS shall be installed only in the following locations:

1. Detached garages and detached accessory structures.
 2. Attached garages separated from the *dwelling unit* living space and *sleeping units* in accordance with Section 406.3.2.
 3. Outdoors on exterior walls located a minimum of 3 feet (914 mm) from doors and windows.
 4. Utility closets and storage or utility spaces within *dwelling units* and *sleeping units*.
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432.11.4 Energy ratings. Individual ESS units shall have a maximum rating of 20 kWh. The aggregate rating structure shall not exceed:

1. 40 kWh within utility closets and storage or utility spaces.
2. 80 kWh in attached or detached garages and detached accessory structures.
3. 80 kWh on exterior walls.
4. 80 kWh outdoors on the ground.

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432.11.5 Electrical installation. ESS shall be installed in accordance with NFPA 70. Inverters shall be *listed* and *labeled* in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters *listed* for utility interaction.

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432.11.6 Fire detection. Rooms and areas within *dwelling units* , *sleeping units* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11 A *heat detector listed* and interconnected to the smoke alarms shall be installed in locations within *dwelling units* , *sleeping units* and attached garages where smoke alarms cannot be installed based on their listing.

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432.11.7 Protection from impact. Stationary storage battery systems installed in a location subject to vehicle damage shall be protected by *approved* barriers. Appliances in garages shall also be installed in accordance with Section 304.3 of the *International Mechanical Code* .

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432.11.8 Ventilation. Indoor installations of ESS that include batteries that produce hydrogen or other flammable gases during charging shall be provided with exhaust ventilation in accordance with Section 432.6.1.

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432.11.9 Toxic and highly toxic gas. ESS that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.

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432.11.10 Electric vehicle use. The temporary use of an *owner* or occupant's electric-powered vehicle to power a *dwelling unit* or *sleeping unit* while parked in an attached or detached garage or outside shall comply with the vehicle manufacturer's instructions and NFPA 70.

1705.19 Commissioning and decommissioning of Energy Storage System. Commissioning and decommissioning of energy storage system shall be subject to *special inspection*. Special inspector shall ensure that the commissioning and decommissioning is conducted in accordance with Section 432 , as applicable.

Reason Statement: An increased number of electrical energy storage systems (ESS) utilizing stationary storage batteries are appearing on the market to help meet the energy needs of society. This proposal does not mandate that ESS or stationary battery storage systems be provided but includes basic safety requirements and minimum safeguards for the installation that should be applied if such systems are provided.

This proposal incorporates the building related provisions from the 2021 edition of the International Fire Code into the Virginia Construction Code. Doing so is intended to reduce confusion and clearly define the building parameters necessary for the evolving technology, distinct from the operational needs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Some of the requirements in this proposal have the potential to increase the cost of providing ESS installations. However, the provisions in this proposal better address risks and owner/user needs in buildings and outdoor installations. Any increased cost addresses the hazards that were not contemplated in previous code editions due to energy storage technology advancements.

Attached Files

- **Energy Storage Systems with Revisions.docx**
<https://va.cdpassess.com/proposal/1188/1630/files/download/680/>

B433-21

VCC: 433 (New)

Proponents: Shahriar Amiri (samiri@arlingtonva.us)

2018 Virginia Construction Code

Add new text as follows:

433 Electric Vehicle (EV) Charging Stations. Proponents: Shahriar Amiri
(samiri@arlingtonva.us)

4/25/2022

2021 Virginia Construction Code

SECTION 433

ELECTRICAL VEHICLE (EV) CHARGING STATIONS

433.1 General. The provisions of this Section shall apply to installation of Electric Vehicle Charging Stations

Exception: EV CHARGING STATION in Group R-3 and R-4 occupancies shall comply with Section 433.11.

433.2 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the EV CHARGING STATION is to be installed.
2. The quantities and types of EV CHARGING STATION to be installed.
3. Manufacturer's specifications, ratings and listings of each EV CHARGING STATION.
4. Description of energy (battery) management systems and their operation.
5. Location and content of required signage.
6. Details on fire suppression EV Charging Station, smoke or fire detection, thermal management, ventilation, exhaust and *deflagration* venting systems, if provided.
7. Support arrangement associated with the installation, including any required seismic restraint.

433.3 Installation and Listing. Where provided, electric vehicle charging stations shall be installed in accordance with *NFPA 70*. Electric vehicle charging system equipment shall be listed and labeled in accordance with *UL 2202*. Electric vehicle supply equipment shall be listed and labeled in accordance with *UL 2594*. Accessibility to electric vehicle charging stations shall be provided in accordance with Chapter 11.

433.3.1 Electrical disconnects. Where the EV CHARGING STATION disconnecting means is not within sight of the main electrical service disconnecting means, placards or directories shall be installed at the location of the main electrical service disconnecting means indicating the location of EV Charging Station(s) disconnecting means in accordance with *NFPA 70*.

433.3.2 Vehicle impact protection. Where EV CHARGING STATION are subject to impact by a motor vehicle, impact protection shall be provided in accordance with this code.

433.4 Location. 433.5.3 Elevation. EV CHARGING STATION shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle
2. Where the floor is located more than one level below the lowest *level of exit discharge*

433.5 Fire detection. An *approved* automatic smoke detection system or radiant energy-sensing fire detection system shall be installed in EV charging station area where located in enclosed parking garages. An *approved* radiant energy-sensing fire detection system shall be installed to protect open parking garage and rooftop installations. Alarm signals from detection systems shall be transmitted to a central station, proprietary or remote station service in accordance with *NFPA 72*, or where *approved* to a constantly attended location.

433.5.1 System status. Where required by the fire *code official*, visible annunciation shall be provided on cabinet exteriors or in other *approved* locations to indicate that potentially hazardous conditions associated with the EV CHARGING STATION exist.

433.6 Fire suppression systems: Enclosed parking garages containing EV CHARGING STATION shall be protected by an automatic sprinkler system designed and installed in accordance with the following:

1. An automatic sprinkler system designed and installed in accordance with Section 903.3.1.1 with a minimum density of 0.3 gpm/ft² (1.14 L/min) based on the fire area or 2,500 square-foot (232 m²) design area, whichever is smaller.

433.8 Exhaust ventilation. Where installed in enclosed parking garages, exhaust ventilation of areas and containing EV charging stations shall be provided in accordance with the International Mechanical Code and Section 433.8.1 or 433.8.2.

433.8.1. Ventilation based on LFL. The exhaust ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammable limit (LFL) of the total volume of the room, area or walk-in unit during the worst-case event of simultaneous charging of batteries at the maximum charge rate, in accordance with nationally recognized standards.

433.8.2 Ventilation based on exhaust rate. Mechanical exhaust ventilation shall be provided at a rate of not less than 1 ft³/min/ft² (5.1 L/sec/m²) of floor area of the room, area or walk-in unit. The ventilation shall be either continuous or shall be activated by a gas detection system in accordance with Section 432.6.1.2.4.

433.8.2.1 Standby power. Mechanical exhaust ventilation shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.5.

433.8.2.2 Installation instructions. Required mechanical exhaust ventilation systems shall be installed in accordance with the manufacturer's installation instructions and the International Mechanical Code.

433.8.2.3 Supervision. Required mechanical exhaust ventilation systems shall be supervised by an approved central station, proprietary or remote station service in accordance with NFPA 72 or shall initiate an audible and visible signal at an approved constantly attended on-site location.

433.9 Separation. The EV CHARGING STATION shall be separated from doors, windows, operable openings into buildings or HVAC inlets by at least 10 feet (1524 mm). 433.7 Means of egress separation from EV Charging Station. EV CHARGING STATION located outdoors and in open parking garages shall be separated from any exit as required by the fire code official to ensure safe egress from EV under fire conditions, but in no case EV Charging Station shall be separated less than 10 feet (3048 mm). EV charging stations located in enclosed parking structures shall be located no less than 25 feet from any exit.

433.10 Special installations. Rooftop and open parking garage EV CHARGING STATION installations shall comply with this section.

1. A Class I standpipe outlet shall be installed at an approved location on the roof level of the building or in the stairway at the top level.

2. The EV CHARGING STATION shall be the minimum of 10 feet (3048 mm) from the fire service access point on the rooftop.

433.11 Spill control and neutralization. Areas containing free-flowing liquid electrolyte or hazardous materials shall be provided with spill control and neutralization in accordance with this section.

433.11.1 Spill control. Spill control shall be provided to prevent the flow of liquid electrolyte or hazardous materials to adjoining rooms or areas.

432.11.2 Neutralization. An approved method that is capable of neutralizing spilled liquid electrolyte from the largest battery or vessel to a pH between 5.0 and 9.0 shall be provided.

Reason Statement: An increased number of Electric Vehicle (EV) Charging Station installations is occurring to help meet the electric vehicle charging needs of society. This proposal does not mandate that (EV) Charging Stations be provided but includes basic safety requirements and minimum safeguards for the installation of these stations that should be applied if such stations are provided.

This proposal incorporates the building related provisions from the 2021 edition of the International Fire Code into the Virginia Construction Code. Doing so is intended to reduce confusion and clearly define the building parameters necessary for the evolving technology, distinct from the operational needs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The code change proposal will not increase or decrease the cost of construction. Some of the requirements in this proposal have the potential to increase the cost of providing ESS installations. However, the provisions in this proposal better address risks and owner/user needs in buildings and outdoor installations. Any increased cost addresses the hazards that were not contemplated in previous code editions due to energy storage technology advancements.

B706.1-21

Proponents: Ronald Clements (clementsro@chesterfield.gov)

2021 International Building Code

Revise as follows:

706.1 General. Each portion of a building separated by one or more fire walls shall be considered a separate building. Fire walls shall be constructed in accordance with Sections 706.2 through 706.11. The extent and location of such fire walls shall provide a complete separation. Where a fire wall separates occupancies that are required to be separated by a fire barrier wall, the most restrictive requirements of each separation shall apply. Equipment and systems are permitted to serve multiple, attached buildings on the same lot where separated by one or more fire walls.

Reason Statement: G130-15 (provided below) removed the code text from 706.1 that states fire walls create separate buildings. The result of G130-15 is that fire walls no longer create separate buildings per 706.1. Application of fire walls is now code section specific regarding what a fire wall does regarding application of that specific code provision. Section 503.1 was revised to address how fire walls impact application of allowable height and area provisions; but, as an example, no such provision was added to chapter 9 to address how fire walls impact application of chapter 9 provisions applicable to buildings. To my knowledge no other code sections throughout the I-codes were reviewed for this impact. The code change reason does not state the intent was to remove the ability to use fire walls to create separate buildings. The intent per the reason statement was to clarify that features and systems shared by buildings separated by fire walls need not be separated from each other other like building features in adjacent buildings. This code change makes it clear that fire walls create separate buildings for application of chapter 9 and other provisions beyond allowable height and area as was always intended. To address the issue of shared systems, the last line was added.

I intent to submit this as an ICC change but, if approved, it will go into the 2027 IBC, which will not be adopted in Virginia until 2029 at the earliest.

G130-15 *The purpose of this proposal is to clarify the intent of these sections of the Code that the requirement for a fire wall in Sections 503.1 and 706.1 is predicated on the determination of the maximum allowable height and area calculations under Chapter 5. Using these sections of Code to control other building features or elements such as means of egress, building systems or building utilities is not intended or implied by these sections of the Code. However, by inclusion of the first sentence in Section 706.1 some code officials have incorrectly interpreted that language to mean that the portions of the various elements and systems on each side of a fire wall must be completely self-contained. There are no requirements in the I Codes that mandate that the placement of fire walls to create a separate building such that its building features need to be separated from other like building features in adjacent buildings. The scope of Section 706 is to provide the technical requirements for the construction of a fire wall. The added language in Section 503.1 along with the strikeout and added language in Section 706.1 will clarify application of these two sections.*

Cost Impact: The code change proposal will decrease the cost of construction

This code change proposal will reduce the cost of construction though I don't know how to give a number. As an example: in prior code editions you could building a 30,000 sf warehouse without installing a sprinkler system by use of a fire barrier at 10,000 sf and a fire wall at 20,000 sf. With the 2015 amendment that same building would require a sprinkler system, even if fire walls were used at both 10,000 and 20,000 square foot area limits.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B706.1-21

This proposal doesn't have any public comments.

B706.1.1-21

IBC®: CHAPTER 7, SECTION 706, 706.1, 706.1.1, 706.2, 706.3, 706.4, TABLE 706.4, 706.5, 706.5.1, 706.5.2, 706.6, 706.6.1, 706.6.2, 706.7, 706.8, 706.9, 706.10, 706.11

Proponents: Shahriar Amiri (samiri@arlingtonva.us)

2021 International Building Code

CHAPTER 7 FIRE AND SMOKE PROTECTION FEATURES SECTION 706 FIRE WALLS

706.1 General. *Fire walls* shall be constructed in accordance with Sections 706.2 through 706.11. The extent and location of such *fire walls* shall provide a complete separation. Where a *fire wall* separates occupancies that are required to be separated by a *fire barrier* wall, the most restrictive requirements of each separation shall apply.

Revise as follows:

706.1.1 Party walls. Any wall located on a *lot line* between adjacent buildings, which is used or adapted for *joint* service between the two buildings, shall be constructed as a *fire wall* in accordance with Section 706. Party walls shall be constructed without openings and shall create separate buildings.

Exceptions:

1. Openings in a party wall separating an *anchor building* and a *mall* shall be in accordance with Section 402.4.2.2.1.
2. ~~Party walls and *fire walls* are not required on *lot lines* dividing a building for ownership purposes where the aggregate height and area of the portions of the building located on both sides of the *lot line* do not exceed the maximum height and area requirements of this code. For the *building official's* review and approval, the official shall be provided with copies of dedicated access easements and contractual agreements that permit the *owners* of portions of the building located on either side of the *lot line* access to the other side for purposes of maintaining fire and life safety systems necessary for the operation of the building.~~

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. *Fire walls* designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.

Exception: In *Seismic Design Categories* D through F, where double *fire walls* are used in accordance with NFPA 221, floor and roof sheathing not exceeding $\frac{3}{4}$ inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction*.

706.3 Materials. *Fire walls* shall be of any *approved* noncombustible materials.

Exception: Buildings of Type V construction.

706.4 Fire-resistance rating. *Fire walls* shall have a *fire-resistance rating* of not less than that required by Table 706.4.

TABLE 706.4 FIRE WALL FIRE-RESISTANCE RATINGS

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, E, H-4, I, R-1, R-2, U	3 ^a
F-1, H-3b, H-5, M, S-1	3
H-1, H-2	4 ^b
F-2, S-2, R-3, R-4	2

- a. In Type II or V construction, walls shall be permitted to have a 2-hour fire-resistance rating.
- b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.7 and 415.8.

706.5 Horizontal continuity. *Fire walls* shall be continuous from *exterior wall to exterior wall* and shall extend not less than 18 inches (457 mm) beyond the exterior surface of *exterior walls*.

Exceptions:

1. *Fire walls* shall be permitted to terminate at the interior surface of combustible exterior sheathing or siding provided that the *exterior wall* has a *fire-resistance rating* of not less than 1 hour for a horizontal distance of not less than 4 feet (1220 mm) on both sides of the *fire wall*. Openings within such *exterior walls* shall be protected by opening protectives having a *fire protection rating* of not less than ³/₄ hour.
2. *Fire walls* shall be permitted to terminate at the interior surface of noncombustible exterior sheathing, exterior siding or other noncombustible exterior finishes provided that the sheathing, siding or other exterior noncombustible finish extends a horizontal distance of not less than 4 feet (1220 mm) on both sides of the *fire wall*.
3. *Fire walls* shall be permitted to terminate at the interior surface of noncombustible exterior sheathing where the building on each side of the *fire wall* is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

706.5.1 Exterior walls. Where the *fire wall* intersects *exterior walls*, the *fire-resistance rating* and opening protection of the *exterior walls* shall comply with one of the following:

1. The *exterior walls* on both sides of the *fire wall* shall have a 1-hour *fire-resistance rating* with ³/₄-hour protection where opening protection is required by Section 705.8. The *fire-resistance rating* of the *exterior wall* shall extend not less than 4 feet (1220 mm) on each side of the intersection of the *fire wall* to *exterior wall*. *Exterior wall* intersections at *fire walls* that form an angle equal to or greater than 180 degrees (3.14 rad) do not need *exterior wall* protection.
2. Buildings or spaces on both sides of the intersecting *fire wall* shall assume to have an imaginary *lot line* at the *fire wall* and extending beyond the exterior of the *fire wall*. The location of the assumed line in relation to the *exterior walls* and the *fire wall* shall be such that the *exterior wall* and opening protection meet the requirements set forth in Sections 705.5 and 705.8. Such protection is not required for *exterior walls* terminating at *fire walls* that form an angle equal to or greater than 180 degrees (3.14 rad).

706.5.2 Horizontal projecting elements. *Fire walls* shall extend to the outer edge of horizontal projecting elements such as balconies, roof overhangs, canopies, *marquees* and similar projections that are within 4 feet (1220 mm) of the *fire wall*.

Exceptions:

1. Horizontal projecting elements without concealed spaces, provided that the *exterior wall* behind and below the projecting element has not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting element on both sides of the *fire wall*. Openings within such *exterior walls* shall be protected by opening protectives having a *fire protection rating* of not less than ³/₄ hour.
2. Noncombustible horizontal projecting elements with concealed spaces, provided that a minimum 1-hour fire-resistance-rated wall extends through the concealed space. The projecting element shall be separated from the building by not less than 1-hour fire-resistance-rated construction for a distance on each side of the *fire wall* equal to the depth of the projecting element. The wall is not required to extend under the projecting element where the building *exterior wall* is not less than 1-hour *fire-resistance rated* for a distance on each side of the *fire wall* equal to the depth of the projecting element. Openings within such *exterior walls* shall be protected by opening protectives having a *fire protection rating* of not less than ³/₄ hour.
3. For combustible horizontal projecting elements with concealed spaces, the *fire wall* need only extend through the concealed space to the outer edges of the projecting elements. The *exterior wall* behind and below the projecting element shall be of not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting elements on both sides of the *fire wall*. Openings within such *exterior walls* shall be protected by opening protectives having a *fire protection rating* of not less than ³/₄ hour.

706.6 Vertical continuity. *Fire walls* shall extend from the foundation to a termination point not less than 30 inches (762 mm) above both adjacent

roofs.

Exceptions:

1. Stepped buildings in accordance with Section 706.6.1.
2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab, provided that:
 - 2.1. The lower *roof assembly* within 4 feet (1220 mm) of the wall has not less than a 1-hour *fire-resistance rating* and the entire length and span of supporting elements for the rated *roof assembly* has a *fire-resistance rating* of not less than 1 hour.
 - 2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the *fire wall*.
 - 2.3. Each building shall be provided with not less than a Class B *roof covering*.
3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck or slabs where both buildings are provided with not less than a Class B *roof covering*. Openings in the roof shall not be located within 4 feet (1220 mm) of the *fire wall*.
4. In buildings of Types III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks, provided that all of the following requirements are met:
 - 4.1. Roof openings are not less than 4 feet (1220 mm) from the *fire wall*.
 - 4.2. The roof is covered with a minimum Class B *roof covering*.
 - 4.3. The roof sheathing or deck is constructed of *fire-retardant-treated wood* for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with $\frac{5}{8}$ -inch (15.9 mm) Type X *gypsum board* directly beneath the underside of the roof sheathing or deck, supported by not less than 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a distance of not less than 4 feet (1220 mm) on both sides of the *fire wall*.
5. In buildings designed in accordance with Section 510.2, *fire walls* located above the 3-hour *horizontal assembly* required by Section 510.2, Item 1 shall be permitted to extend from the top of this *horizontal assembly*.
6. Buildings with sloped roofs in accordance with Section 706.6.2.

706.6.1 Stepped buildings. Where a *fire wall* also serves as an *exterior wall* for a building and separates buildings having different roof levels, such wall shall terminate at a point not less than 30 inches (762 mm) above the lower roof level. *Exterior walls* above the *fire wall* extending more than 30 inches (762 mm) above the lower roof shall be of not less than 1-hour fire-resistance-rated construction from both sides with openings protected by fire assemblies having a *fire protection rating* of not less than $\frac{3}{4}$ hour. Portions of the *exterior walls* greater than 15 feet (4572 mm) above the lower roof shall be of nonfire-resistance-rated construction unless otherwise rated construction is required by other provisions of this code.

Exception: A *fire wall* serving as part of an *exterior wall* that separates buildings having different roof levels shall be permitted to terminate at the underside of the roof sheathing, deck or slab of the lower roof, provided that Items 1, 2 and 3 are met. The *exterior wall* above the *fire wall* is not required to be of fire-resistance-rated construction unless required by other provisions of this code.

1. The lower *roof assembly* within 10 feet (3048 mm) of the *fire wall* has not less than a 1-hour *fire-resistance rating*.
2. The entire length and span of supporting elements for the rated *roof assembly* shall have a *fire-resistance rating* of not less than 1 hour.
3. Openings in the lower roof shall not be located within 10 feet (3048 mm) of the *fire wall*.

706.6.2 Buildings with sloped roofs. Where a *fire wall* serves as an interior wall for a building, and the roof on one side or both sides of the *fire wall* slopes toward the *fire wall* at a slope greater than 2 units vertical in 12 units horizontal (2:12), the *fire wall* shall extend to a height equal to the height of the roof located 4 feet (1219 mm) from the *fire wall* plus 30 inches (762 mm). The extension of the *fire wall* shall be not less than 30 inches (762 mm).

706.7 Combustible framing in fire walls. Adjacent combustible members entering into a concrete or masonry *fire wall* from opposite sides shall not have less than a 4-inch (102 mm) distance between embedded ends. Where combustible members frame into hollow walls or walls of hollow units, hollow spaces shall be solidly filled for the full thickness of the wall and for a distance not less than 4 inches (102 mm) above, below and between the structural members, with noncombustible materials *approved for fireblocking*.

706.8 Openings. Each opening through a *fire wall* shall be protected in accordance with Section 716 and shall not exceed 156 square feet (15 m²). The aggregate width of openings at any floor level shall not exceed 25 percent of the length of the wall.

Exceptions:

1. Openings are not permitted in party walls constructed in accordance with Section 706.1.1.

2. Openings shall not be limited to 156 square feet (15 m²) where both buildings are equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

706.9 Penetrations. Penetrations of *fire walls* shall comply with Section 714.

706.10 Joints. *Joints* made in or between *fire walls* shall comply with Section 715.

706.11 Ducts and air transfer openings. Ducts and air transfer openings shall not penetrate *fire walls*.

Exception: Penetrations by ducts and air transfer openings of *fire walls* that are not on a *lot line* shall be allowed provided that the penetrations comply with Section 717. The size and aggregate width of all openings shall not exceed the limitations of Section 706.8.

Reason Statement: The introduction of this section in 2018 has created much confusion. While the original intent was narrowly defined, this section has effectively created a situation where property lines, fire separation distances and the basics of the building codes are compromised. Many argue that property lines no longer created any restrictions across a city block as long as they are constructed with construction types that allow for unlimited height and area. The agreement described in this section does not provide for occupant protection envisioned by the code. It is just a maintenance access agreement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase or decrease the cost of construction.

B903.2.3-21

Proponents: David Beahm

2018 Virginia Construction Code

Revise as follows:

[F] 903.2.3 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 20,000 square feet (1858 m²) in area.
2. The Group E fire area is located on a floor other than a level of exit discharge serving such occupancies.

Exceptions: In buildings where every classroom has not fewer than one exterior exit door at ground level, an automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area.

- ~~3. The Group E fire area has an occupant load of 300 or more.~~

Reason Statement: During the 2018 ICC code change a change was put into place and it was not reviewed for consistency with current Virginia changes and now during the code update training it was questioned about its possible inconsistency. Virginia has consistently modified the model code square footage related to Educational Use and Occupancy with regards to requiring sprinklers from model code 12,000 to Virginia's 20,000. The change that was made during the 2018 model code process was to additionally add the maximum occupant load number of 300. While this is actually consistent with how Virginia looks at religious worship A-3 occupant loads with exemption 2 of 903.2.1.3. Most would say that this may actually be creating consistency even though within A-3 it keeps the maximum square footage at 12,000. There are many differences between the two with regards to uses of the space in that many churches only have a main sanctuary and many of those have fixed seats that create limitations to the amount of occupants. Now let's look at a small private school (which is what this change really effects) that acquires a large space that stays under the 20,000 square feet. Most public schools would not have a space this small and if they did the same allowances would be allowed. If a school were to have a just a full-size basketball court that could be used for many other purposes, the normal size is 84' by 50' which is 4,200 square feet. This space would then have an occupant load set at 280 for the least allowable calculation (15 net), which would then only allow for 20 additional occupants. Now it could be argued that you could justify that the space would not be used concurrently with the remainder of the area, but that isn't a guarantee. Also, if you used the calculation that would more than likely be used is for concentrated chairs/not fixed (7 net) instead of tables and chairs the occupant load would be 600. While this may be looked at a larger potential for fatalities due to the use of education and not the religious worship, I would argue it may be less. I don't know of any religious worship location that performs fire drills or that is inspected on a yearly basis as a requirement as schools are and have fire drills.

Cost Impact: The code change proposal will decrease the cost of construction
This will remove the requirement for the structure to be sprinklered if the occupant load is greater than 300, but still under the 20,000 square foot requirement that currently exists.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B903.2.3-21

This proposal doesn't have any public comments.

Proposal # 1194

B903.4.2-21

Proponents: Charles Littlefield (caseylittlefieldmcp@gmail.com)

2018 Virginia Construction Code

Revise as follows:

[F] **903.4.2 Alarms.** *Approved* audible devices shall be connected to every automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the *building* in an *approved* location. Where a *fire alarm system* is installed, actuation of the automatic sprinkler system shall actuate the *building fire alarm system*. Group R-2 occupancies that contain 16 or more *dwelling units* or *sleeping units*, any *dwelling unit* or *sleeping unit* two or more stories above the lowest level of exit discharge, or any *dwelling unit* or *sleeping unit* more than one story below the highest level of exit discharge of exits serving the *dwelling unit* or *sleeping unit* shall provide a manual fire alarm box at an *approved* location to activate the suppression system alarm.

Exception: Buildings supplied with an off site monitored Fire Alarm System installed in accordance with VCC 907.

Reason Statement: The intent of 903.4.2 is to provide an outside alarm that notifies anyone in the immediate vicinity that the fire sprinkler system in the building has been activated.

Almost all new buildings that have a Fire Sprinkler system installed also have a Fire Alarm system that provides both occupant notification and monitoring of the fire sprinkler system as in accordance with 903.4.1. with the requirement to add an alarm on a building that has off-site monitoring of the fire alarm system is redundant and unnecessary. A case in point would be a building in an urban environment would most likely get attention from passerby's on the street where that same building located in an rural environment most likely would not. To be clear the exception is only allowed if a off-site monitored Fire alarm system also monitors the fire sprinkler system.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal may decrease the cost of construction.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B903.4.2-21

This proposal doesn't have any public comments.

B907.5.2.3.2-21

Proponents: DHCD Staff (sbco@dhcd.virginia.gov)

2021 International Building Code

Revise as follows:

TABLE 907.5.2.3.2 VISIBLE ALARMS

NUMBER OF SLEEPING UNITS OR DWELLING UNITS	SLEEPING ACCOMMODATIONS WITH VISIBLE ALARMS
6 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

Reason Statement: Section 907.5.2.3.2 requires visible alarm notification for habitable spaces in dwelling units and sleeping units (in Group I-1 and R-1 occupancies) in accordance with Table 907.5.2.3.2. The table, however, only mentions "sleeping units" and it does not mention "dwelling units". This editorial change adds the words "or dwelling units" to the table so that it can be properly utilized as charged by the section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial change with no impact on the construction cost.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency
This is an editorial change with no impact on resiliency.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B907.5.2.3.2-21

This proposal doesn't have any public comments.

B918.1-21

Proponents: Andrew Milliken (amilliken@staffordcountyva.gov)

2018 Virginia Construction Code

Revise as follows:

918.1 General. For localities utilizing public safety wireless communications, dedicated infrastructure to accommodate and perpetuate continuous in-building emergency communication to allow *emergency public safety personnel* to send and receive emergency communications shall be provided in new *buildings* and *structures* in accordance with this section.

Exceptions:

1. *Buildings* of Use Groups A-5, I-4, within *dwelling units* of R-2, R-3, R-4, R-5, and U.
2. Buildings of Types IV and V *construction* without basements, that are not considered unlimited area *buildings* in accordance with Section 507.
3. Above grade single story buildings of less than 20,000 square feet (1858 m²).
4. *Buildings* or leased spaces occupied by federal, state, or local governments, or the contractors thereof, with security requirements where the *building official* has *approved* an alternative method to provide emergency communication equipment for *emergency public safety personnel*.
5. Where the *owner* provides technological documentation from a qualified individual that the *structure* or portion thereof does not impede emergency communication signals.
6. ~~*Buildings* in *localities* that do not provide the additional communication equipment required for the operation of the system.~~

918.1.1 Installation. ~~The *building owner* shall install radiating cable, such as coaxial cable or equivalent. The radiating cable shall be installed in dedicated conduits, raceways, plenums, attics, or roofs, compatible for these specific installations as well as other applicable provisions of this code. The *locality* shall be responsible for the installation of any additional communication equipment required for the operation of the system. Where provided, an in-building two-way emergency responder communication coverage system shall be designed, installed and tested in accordance with section 510.4 and 510.5 of the International Fire Code. In-building, two-way emergency responder communication coverage within the building shall be based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.~~

918.1.3 Inspection. In accordance with Section 113.3, all installations shall be inspected prior to concealment.

Delete without substitution:

~~**918.1.2 Operations.** The *locality* will assume all responsibilities for the operation and maintenance of the emergency communication equipment. The *building owner* shall provide sufficient operational space within the *building* to allow the *locality* access to and the ability to operate in-building emergency communication equipment.~~

918.2 Acceptance test. Upon completion of installation, after providing reasonable notice to the *owner* or their representative, *emergency public safety personnel* shall have the right during normal business hours, or other mutually agreed upon time, to enter onto the property to conduct field tests to verify that the required level of radio coverage is present at no cost to the *owner*. Any noted deficiencies in the installation of the radiating cable or operational space shall be provided in an inspection report to the *owner* or the *owner's* representative.

Reason Statement: At present, 47 states as well as Washington, DC and Puerto Rico have mandatory requirements for emergency responder communication systems in new buildings. None, other than Virginia, share the responsibility of the system with the locality. This proposal revises outdated technology, language and responsibilities for providing in-building emergency responder communication systems. **This proposal was supported by a majority of members of the Study Group convened to look into this topic.**

The effectiveness and reliability of emergency responder communication is one of if not the most important aspects of successful emergency response and protection of public safety. In fact, as wireless technologies advance and community hazards expand, these public safety communication tools quickly become the backbone of incident response for not only fire and rescue personnel but also law enforcement and other first responders. Just as the water provided in building standpipes is critical to firefighting operations in large buildings, clear and dependable communications is vital to the safety of first responders in these buildings. This is in keeping with the philosophy inherent in the model codes that, when a facility grows too large or complex for effective fire response, fire protection features must be provided within the building. Building construction features and materials can absorb or block the radio frequency energy used to carry the signals inside or outside the building. Blockage or absorption of the radio frequency signal can prevent a critical message from an emergency responder from being received and acknowledged. Depending on the incident, this loss of information can place other emergency responders in greater danger or may prevent an injured or disoriented emergency responder from communicating for assistance.

The current VCC language requires the use of out-dated technology and in some cases the installation of equipment that may never be used. Unless meeting one of the exemption requirements, building owners are required to route hundreds of feet of likely disconnected cabling throughout

the building including in areas where existing coverage may already be adequate. This proposal does NOT remove or modify any of the five building exemptions currently indicated by the current code (VCC 916.1) so as to maintain consistency throughout Virginia. In addition, the current VCC language provides no recognition as to the current level of public safety communication strength currently on site. Without additional guidance, this could suggest that a building owner is responsible for providing a higher level of radio coverage than what currently is present in reality - a cost that is not fair to be burdened by the building owner or developer. The proposed language ensures that the building is only required to maintain the existing level of public safety radio communication coverage available at the exterior of the building.

Furthermore, just as building standpipe systems, fire hydrant systems, fire alarm systems and other fire protection systems are required to be provided as part of the building infrastructure for emergency responder use, the reliability and dependability of emergency radio enhancement systems demand that they be similarly connected to and monitored by the building fire alarm system. Finally, the current VCC language does not provide any reference standard for the installation or testing of such systems. This proposal includes a reference to the IFC for these details to ensure that they are capable, compatible and interoperable for emergency response at any time or location.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

Since this proposal does not remove or modify any of the five building exemptions from providing in-building communication infrastructure, this proposal only applies to the same buildings where infrastructure is already required to be provided. Although the responsibility for the system installation moves to the building owner, the costs have not increased. In fact, this proposal provides the ability of building owners and developers to utilize cost-effective technology to accomplish the requirement with less labor and materials. Moreover, it also works to ensure that such technology is only provided where it is found to be needed and only to the level at which the public safety system currently provides at the exterior of the building. These cost-saving efforts are expected to equal or exceed any added cost to monitor such system by the building fire alarm system. Also, since the proposal is based on national and international standards that have been in place for years, most large construction projects already anticipate these costs for construction around the country.

Resiliency Impact Statement: This proposal will increase Resiliency

As compared to the ineffective and in some cases unnecessarily burdensome code language currently present in the VCC, this proposal represents a tremendous increase in building and public safety resiliency. Ensuring that first responders are able to effectively communicate is invaluable to the successful outcome of emergency response incidents and the protection of lives and property. The assurance for emergency responder radio coverage that this proposal provides does so not only for the major, or once-in-a-lifetime catastrophes but also many times over in the daily smaller "routine" emergencies that occur throughout buildings.

Attached Files

- **BDA_White_Paper_-_Final.pdf**
<https://va.cdpaccess.com/proposal/985/1552/files/download/663/>

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B918.1-21

This proposal doesn't have any public comments.

B918.1(2)-21

Proponents: DHCD Staff on behalf of the following stakeholders represented at the In-Building Emergency Communications Study Group: The Apartment & Office Building Association/Virginia Apartment Management Association, Backhaul Engineering, Virginia Restaurant, Lodging & Travel Association, Virginia Fire Prevention Association, and the Virginia Fire Chiefs Association

2018 Virginia Construction Code

SECTION 918 IN-BUILDING EMERGENCY COMMUNICATIONS COVERAGE

918.1 General. For localities utilizing public safety wireless communications, dedicated infrastructure to accommodate and perpetuate continuous in-building emergency communication *equipment* to allow *emergency public safety personnel* to send and receive emergency communications shall be provided in new *buildings* and *structures* in accordance with this section.

Exceptions:

1. *Buildings* of Use Groups A-5, I-4, within *dwelling units* of R-2, R-3, R-4, R-5, and U.
2. Buildings of Types IV and V *construction* without basements, that are not considered unlimited area *buildings* in accordance with Section 507.
3. Above grade single story buildings of less than 20,000 square feet (1858 m²).
4. *Buildings* or leased spaces occupied by federal, state, or local governments, or the contractors thereof, with security requirements where the *building official* has *approved* an alternative method to provide emergency communication equipment for *emergency public safety personnel*.
5. Where the *owner* provides technological documentation from a qualified individual that the *structure* or portion thereof does not impede emergency communication signals.
6. *Buildings* in *localities* that do not provide the additional communication *equipment* required for the operation of the system.

Revise as follows:

918.1.1 Installation. In-building two-way emergency responder communication coverage systems shall comply with Sections 510.4 and 510.5 of the International Fire Code, except that the acceptance testing procedure required by Section 510.5.4 of the International Fire Code shall be the responsibility of the locality. The *building owner* shall install radiating cable, such as coaxial cable or equivalent. The radiating cable shall be installed in dedicated conduits, raceways, plenums, attics, or roofs, compatible for these specific installations as well as other applicable provisions of this code. The *locality* shall be responsible for the installation of any additional communication *equipment* required for the operation of the system.

918.1.2 Operations. The *locality* will assume all responsibilities for the operation and maintenance of the emergency communication *equipment*. The *building owner* shall provide sufficient operational space within the *building* to allow the *locality* access to and the ability to operate in-building emergency communication *equipment*.

918.1.3 Inspection. In accordance with Section 113.3, all installations shall be inspected prior to concealment.

918.2 Acceptance test. Upon completion of installation, after providing reasonable notice to the *owner* or their representative, *emergency public safety personnel* shall have the right during normal business hours, or other mutually agreed upon time, to enter onto the property to conduct field tests to verify that the required level of radio coverage is present at no cost to the *owner*. Any noted deficiencies in the installation of the radiating cable or operational space shall be provided in an inspection report to the *owner* or the *owner's* representative.

2021 International Building Code

Delete without substitution:

~~**[F] 2702.2.3 Emergency responder communication coverage systems.** Standby power shall be provided for in-building 2-way emergency responder communication coverage systems required in Section 918 and the *International Fire Code*. The standby power supply shall be capable of operating the in-building 2-way emergency responder communication coverage system at 100 percent system operation capacity for a duration of not less than 12 hours.~~

Reason Statement: This proposal was developed during the in-building emergency communications (IBEC) study group to provide references to the IFC, which in turn provides technical provisions for IBEC systems that otherwise do not exist in the building code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction.

Resiliency Impact Statement: This proposal will increase Resiliency
This proposal will increase the resiliency of buildings by providing technical references to the IFC that will enhance in-building emergency communications to allow emergency personnel to better respond to building emergencies.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: B918.1(2)-21

This proposal doesn't have any public comments.

B918.1.1-21

VCC: 918.1.1

Proponents: DHCD Staff on behalf of the following stakeholders represented at the In-Building Emergency Communications Study Group: The Apartment & Office Building Association/Virginia Apartment Management Association, Virginia Department of Fire Programs, Virginia Restaurant, Lodging & Travel Association, Virginia Fire Prevention Association, Virginia Fire Chiefs Association, and the Virginia Building and Code Officials Association.

2018 Virginia Construction Code

Revise as follows:

918.1.1 Installation. The *building owner* shall install ~~radiating cable, such as coaxial cable or equivalent~~ cabling. The ~~radiating~~ cable shall be installed in dedicated conduits, raceways, plenums, attics, or roofs, compatible for these specific installations as well as other applicable provisions of this code. The *locality* shall be responsible for the installation of any additional communication *equipment* required for the operation of the system.

Reason Statement: This proposal was developed during the in-building emergency communications (IBEC) study group and seeks to remove the antiquated language of "radiating cable" by replacing it with the simple terminology, "cabling." The language change removes design restrictions and opens the door for new technologies that can be used for IBEC systems.

Resiliency Impact Statement: This proposal will increase Resiliency

This proposal will increase resiliency by not binding IBEC systems to antiquated technology. Providing the opportunity for newer, more efficient communication systems technology enhances the IBEC system and the resiliency of buildings.

Cost Impact: The code change proposal will decrease the cost of construction

This change can decrease the cost of construction by allowing alternative technologies beyond radiating cable.

B1006.3.4-21

Proponents: Lyle Solla-Yates (lyle.sollayates@gmail.com)

2018 Virginia Construction Code

1006.3.3.1 Mixed occupancies. Where one *exit*, or *exit access stairway* or *ramp* providing access to *exits* at other *stories*, is permitted to serve individual *stories*, mixed occupancies shall be permitted to be served by single *exits* provided each individual occupancy complies with the applicable requirements of Table 1006.3.3(1) or 1006.3.3(2) for that occupancy. Where applicable, cumulative *occupant loads* from adjacent occupancies shall be considered to be in accordance with the provisions of Section 1004.1. In each *story* of a mixed occupancy building, the maximum number of occupants served by a single *exit* shall be such that the sum of the ratios of the calculated number of occupants of the space divided by the allowable number of occupants indicated in Table 1006.3.3(2) for each occupancy does not exceed one. Where *dwelling units* are located on a story with other occupancies, the actual number of *dwelling units* divided by four plus the ratio from the other occupancy does not exceed one.

Revise as follows:

TABLE 1006.3.3(1) STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE
Basement, first, second or third, fourth, fifth, or sixth story above grade plane	R-2 ^{a,b}	4 dwelling units	125 feet
Fourth Seventh story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 3048 mm.

NP = Not Permitted.

NA = Not Applicable.

- a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1030.
- b. This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1006.3.3(2).

Reason Statement: Experience in Seattle and New York City has shown that this kind of development with a limited floorplan can be allowed safely, as well as in other countries. This allows more compact missing middle residential development that was historically common in Virginia but has not been permitted for many years. Reviewers note that there is still a need for reliable aerial access, sprinklers, and alarms.

For more on this see the attached articles "The Single-Staircase Radicals Have a Good Point" by writer Henry Grabar in Slate posted here <https://slate.com/business/2021/12/staircases-floor-plan-twitter-housing-apartments.html> and "The Case for More Single Stair Buildings in the US" by architect Michael Eliason in Treehugger posted here <https://www.treehugger.com/single-stair-buildings-united-states-5197036>

Cost Impact: The code change proposal will decrease the cost of construction. Reducing the number of staircases required for smaller missing middle residential structures will reduce cost per square foot and make more sites and configurations feasible.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Attached Files

- **The Single-Staircase Radicals Have a Good Point Grabar.pdf**
<https://va.cdpass.com/proposal/944/1197/files/download/525/>
- **singlestaireliason.pdf**
<https://va.cdpass.com/proposal/944/1197/files/download/521/>

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B1006.3.4-21

This proposal doesn't have any public comments.

Proposal # 944

B1010.2.8-21

Proponents: DHCD Staff on behalf of the following stakeholders represented at the Active Shooter and Hostile Threat Events in Public Buildings Study Group: Virginia Building & Code Officials Association, Virginia Fire Prevention Association, Nightlock

2018 Virginia Construction Code

Revise as follows:

Section 108.1 When applications are required. Application for a permit shall be made to the *building official* and a permit shall be obtained prior to the commencement of any of the following activities, except that applications for emergency *construction*, alterations or *equipment* replacement shall be submitted by the end of the first *working day* that follows the day such work commences. In addition, the *building official* may authorize work to commence pending the receipt of an application or the issuance of a permit.

1. *Construction* or demolition of a *building* or *structure*. Installations or alterations involving (i) the removal or addition of any wall, partition or portion thereof, (ii) any structural component, (iii) the repair or replacement of any required component of a fire or smoke rated assembly, (iv) the alteration of any required means of egress system, including the addition or removal of emergency supplemental hardware, (v) water supply and distribution system, sanitary drainage system or vent system, (vi) electric wiring, (vii) fire protection system, mechanical systems, or fuel supply systems, or (viii) any *equipment* regulated by the USBC.
2. For *change of occupancy*, application for a permit shall be made when a new certificate of occupancy is required by the VEBC.
3. Movement of a *lot line* that increases the hazard to or decreases the level of safety of an existing *building* or *structure* in comparison to the *building code* under which such *building* or *structure* was constructed.
4. Removal or disturbing of any asbestos containing materials during the *construction* or demolition of a *building* or *structure*, including additions.

110.1.1 Consultation and notification. Prior to approval or removal of emergency supplemental hardware, the building code official shall consult with the local fire code official, or state fire code official if no local fire code official exists, and head of the local law-enforcement agency. The local fire code official; the state fire code official; and the local fire, EMS, and law-enforcement first responders shall be notified by the building code official of such approval or removal, after approval or removal of such *emergency supplemental hardware* ~~by the building code official.~~

SECTION 202 DEFINITIONS. "Public Building" - a structure or building that is owned, leased, or otherwise occupied by a municipality or the state and used for any municipal or public purposes by the municipality or the state.

~~1010.1.4.4~~ **1010.2.8 Locking arrangements in educational occupancies** Emergency Supplemental Hardware. In Group E occupancies, except Group E day care facilities, ~~and~~ Group B educational occupancies and public buildings, *exit access doors* from classrooms, offices, and other occupied rooms, except for exit doors and doors across corridors, shall be permitted to be provided with *emergency supplemental hardware* where all of the following conditions are met:

1. The door shall be capable of being opened from outside the room with a key, proprietary device provided by the manufacturer, or other *approved means*.
2. The door shall be openable from within the room in accordance with Section 1010.1.9, except *emergency supplemental hardware* is not required to comply with Chapter 11.

Note: School officials and building owners should consult with their legal counsel regarding provisions of the Americans with Disabilities Act of 1990 (42 USC § 12101 et seq.) and any other applicable requirements.

3. Installation of *emergency supplemental hardware* on fire door assemblies must comply with Section 716.2. Modifications shall not be made to listed *panic hardware*, fire door *hardware*, or door closures.
4. The *emergency supplemental hardware* shall not be capable of being used on other doors not intended to be used and shall have at least one component that requires modification to, or is permanently affixed to, the surrounding wall, floor, door, or frame assembly *construction* for it to properly function.
5. Employees shall engage in lockdown training procedures on how to deploy and remove the *emergency supplemental hardware*, and its use shall be incorporated in the *approved* lockdown plan complying with the SFPC.
6. The *emergency supplemental hardware* and its components shall be maintained in accordance with the SFPC.
7. *Approved emergency supplemental hardware* shall be of consistent type throughout a building.

Exception: The *building official* may approve alternate types of *emergency supplemental hardware* in accordance with Section 110.1 when a consistent device cannot be installed.

1103.2.15 Emergency supplemental hardware. In Group E occupancies, except Group E day care facilities, ~~and~~ Group B educational occupancies, and public buildings, when *emergency supplemental hardware* is deployed during an active shooter or hostile threat event and

provided in accordance with Section ~~1010.1.4.4~~ 1010.2.8, is not required to comply with this chapter.

2018 Virginia Statewide Fire Prevention Code

Revise as follows:

1031.11 Emergency supplemental hardware. *Emergency supplemental hardware* shall be installed in accordance with the *applicable building code* and shall be *maintained* in accordance with this code, the conditions of its approval and the manufacturer's instructions. The *fire code official* shall be authorized to revoke the use and storage of *emergency supplemental hardware* within a *building* for due cause based on failure to comply with requirements in this code or the *applicable building code*. Revocations shall be rescinded upon achieving compliance with this code and the *applicable building code*.

Reason Statement: The proposal intends to comply with the SB 333 and HB 670 by expanding on the existing provisions for ESH. The gist of the proposal is the addition of "public buildings" to the list of uses/occupancies already allowed to be provided with ESH. The proposal was generated as a result of discussions during the Active Shooter and Hostile Threats in Public Buildings - Study Group, convened pursuant to the aforementioned bills. For more information on the Study Group activities and discussions, please see attached Study Group Report.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. The proposal intends to **allow** the installation of ESH in public buildings, it does not **mandate** such. Should the building owner(s) decide to install ESH, the proposal could reduce or increase the cost of construction, depending upon the type of locking devices selected.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency. While the proposal does not increase the resiliency of buildings, arguments could be made that the resiliency of building occupants could be increased against active shooter or hostile threats events. Conversely, it could also be claimed that the resiliency of occupants could be reduced by enabling assailants to lock occupants in a given room and prevent first responders from entering.

Attached Files

- **20220407 Active Sh. and Hostile Threats in Pub.pdf**
<https://va.cdpassess.com/proposal/1012/1448/files/download/629/>

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B1010.2.8-21

This proposal doesn't have any public comments.

B1020.1-21

Proponents: Amy Feltner (alight@fcva.us)

2018 Virginia Construction Code

Revise as follows:

TABLE 1020.1 CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system ^b
H-1, H-2, H-3	All	Not Permitted	1
H-4, H-5	Greater than 30	Not Permitted	1
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	1	0.5
I-2 ^a	All	Not Permitted	0
I-1, I-3	All	Not Permitted	0
<u>I-3</u>	<u>All</u>	<u>Not Permitted</u>	<u>0</u>
1-4	All	1	0

Reason Statement: The adoption of the International Codes in lieu of the BOCA Building Codes grouped I-1 and I-3 together in the corridor rating table. The International Code required a one hour rating for Use Groups I-1 and I-3. However, the Department of Corrections (DOC) disapproved of this requirement as the BOCA Building Codes permitted the I-3 corridors to be reduced to smoke partitions. With DOC having "had no adverse impact for 10 years" and fire officials held no opposition, the corridor rating was changed to zero. The initial proposal, however, may have absorbed the I-1 unintentional. With the recent introduction of the I-1 *condition 1* and I-1 *condition 2* terminology and the allowance of *condition 2* permitting "residents that may require physical assistance from staff to respond to an emergency situation to complete building evacuation", a rated corridor should be reinstated for the I-1 Use Group.

Cost Impact: The code change proposal will not increase or decrease the cost of construction zero

Resiliency Impact Statement: This proposal will increase Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B1020.1-21

This proposal doesn't have any public comments.

B1022.2.3-21

Proponents: DHCD Staff (sbco@dhcd.virginia.gov)

2021 International Building Code

Add new text as follows:

1022.2.3 Door Operations. Exterior exit doors shall be either power-operated doors or low-energy power-operated doors.

1022.2.3.1 Doors in a series. Where doors in a series are provided, such as at vestibules, each door, including the interior door serving such spaces, shall be either power-operated doors or low-energy power operated doors.

Reason Statement: Proposal submitted as a response to letter received from the Virginia Delegate David A. Reid and Virginia Senator Jennifer Boysko. In the letter, Delegate Reid and Senator Boysko "recommend that the Virginia Building Code be amended to ensure that handicap accessible buttons are required on all doors leading to the building exit and not just the final exterior doors". See attached letter for additional details. Doors served by push plate buttons are commonly referred to by the codes as low-energy power-operated doors. Given that power-operated doors would provide similar door functions, the proposal uses the two defined terms as options for achieving the intended result - door operation assistance for "Virginia's elderly and handicapped residents".

Cost Impact: The code change proposal will increase the cost of construction
Given that the proposal mandates the installation of features not currently required by the code, the construction cost would increase.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency
While the proposal would not increase the resiliency of buildings, it could be argued that the resiliency of elderly and handicapped occupants would be increased.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: B1022.2.3-21

This proposal doesn't have any public comments.

B1103.2.15-21

Proponents: Daniel Willham (daniel.willham@fairfaxcounty.gov)

2018 Virginia Construction Code

Revise as follows:

1103.2.15 Emergency supplemental hardware. In Group E occupancies, except Group E day care facilities, and Group B educational occupancies, ~~when emergency supplemental hardware is not required to comply with this chapter when~~ deployed during an active shooter or hostile threat event and provided in accordance with ~~Section 1010.1.4.4. Section 1010.2.8.1010.1.4.4.~~

Reason Statement: This proposal is just a language clean-up with revised wording to make it a complete sentence (instead of a series of dependent clauses), similar to the other sub-sections in this section. The change in section number only reflects the new section location in the 2021 code. There is no technical change.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal is a language clean-up for grammar and does not affect construction cost.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency. This proposal is not related to resiliency.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B1103.2.15-21

This proposal doesn't have any public comments.

B1112.1-21

Proponents: Amy Feltner (alight@fcva.us)

2021 International Building Code

Revise as follows:

1112.1 Signs. Required accessible elements shall be identified by the International Symbol of Accessibility at the following locations.

1. Accessible parking spaces required by Section 1106.2.

~~**Exception:** Where the total number of parking spaces provided is four or less, identification of accessible parking spaces is not required.~~

2. *Accessible* parking spaces required by Section 1106.3.

Exception: In Group I-1, R-2, R-3 and R-4 facilities, where parking spaces are assigned to specific *dwelling units* or *sleeping units*, identification of *accessible* parking spaces is not required.

3. *Accessible* passenger loading zones.
4. *Accessible* toilet or bathing rooms where not all toilet or bathing rooms are *accessible*.
5. *Accessible* entrances where not all entrances are *accessible*.
6. *Accessible* check-out aisles where not all aisles are *accessible*. The sign, where provided, shall be above the check-out aisle in the same location as the checkout aisle number or type of check-out identification.
7. *Accessible* dressing, fitting and locker rooms where not all such rooms are *accessible*.
8. *Accessible areas of refuge* in accordance with Section 1009.9.
9. Exterior areas for assisted rescue in accordance with Section 1009.9.
10. In recreational facilities, lockers that are required to be *accessible* in accordance with Section 1110.10.

Reason Statement: Reason Statement:

The exception is proposed to be removed. This is in violation of The Code of Virginia § 36-99.11. (Also Virginia Construction Code 1106.8) Identification of disabled parking spaces by above grade signage.

A. All parking spaces reserved for the use of persons with disabilities shall be identified by above grade signs, regardless of whether identification of such spaces by above grade signs was required when any particular space was reserved for the use of persons with disabilities. A sign or symbol painted or otherwise displayed on the pavement of a parking space shall not constitute an above grade sign. Any parking space not identified by an above grade sign shall not be a parking space reserved for the disabled within the meaning of this section.

B. All above grade disabled parking space signs shall have the bottom edge of the sign no lower than four feet nor higher than seven feet above the parking surface. Such signs shall be designed and constructed in accordance with the provisions of the Uniform Statewide Building Code.

C. Building owners shall install above grade signs identifying all parking spaces reserved for the use of persons with disabilities in accordance with this section and the applicable provisions of the Uniform Statewide Building Code by January 1, 1993.

D. Effective July 1, 1998, all disabled parking signs shall include the following language: PENALTY, \$100-500 Fine, TOW-AWAY ZONE. Such language may be placed on a separate sign and attached below existing above grade disabled parking signs, provided that the bottom edge of the attached sign is no lower than four feet above the parking surface.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
none

Resiliency Impact Statement: This proposal will increase Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: B1112.1-21

This proposal doesn't have any public comments.

Proposal # 1151

B1602-21

Proponents: Resiliency Sub-Workgroup

2021 International Building Code

CHAPTER 2 DEFINITIONS

SECTION 202 DEFINITIONS

Revise as follows:

[BS] ESSENTIAL FACILITIES. Buildings and other structures that are intended to remain operational in the event of extreme environmental loading from *flood*, wind, tornadoes, snow or earthquakes.

[BS] NOMINAL LOADS. The magnitudes of the *loads* specified in Chapter 16 (dead, live, soil, wind, tornado, snow, rain, *flood* and earthquake).

[BS] RISK CATEGORY. A categorization of buildings and *other structures* for determination of *flood*, wind, tornado, snow, ice and earthquake *loads* based on the risk associated with unacceptable performance.

CHAPTER 16 STRUCTURAL DESIGN

SECTION 1602 NOTATIONS

Revise as follows:

1602.1 Notations. The following notations are used in this chapter:

D	=	Dead load.
D_i	=	Weight of ice in accordance with Chapter 10 of ASCE 7.
E	=	Combined effect of horizontal and vertical earthquake induced forces as defined in Section 12.4 of ASCE 7.
F	=	Load due to fluids with well-defined pressures and maximum heights.
F_a	=	Flood load in accordance with Chapter 5 of ASCE 7.
H	=	Load due to lateral earth pressures, ground water pressure or pressure of bulk materials.
L	=	Live load.
L_r	=	Roof live load.
R	=	Rain load.
S	=	Snow load.
T	=	Cumulative effects of self-straining load forces and effects.
V_{asd}	=	Allowable stress design wind speed, miles per hour (mph) (km/hr) where applicable.
V	=	Basic design wind speeds, miles per hour (mph) (km/hr) determined from Figures 1609.3(1) through 1609.3(12) or ASCE 7.
V_T	=	Tornado speed, miles per hour (mph) (m/s) determined from Chapter 32 of ASCE 7.
W	=	Load due to wind pressure.
W_i	=	Wind-on-ice in accordance with Chapter 10 of ASCE 7.

SECTION 1603 CONSTRUCTION DOCUMENTS

Revise as follows:

1603.1.4 Wind and tornado design data. The following information related to wind *loads*, and where required by Section 1609.5 *tornado loads*, shall be shown, regardless of whether wind *loads* govern the design of the lateral force-resisting system of the structure:

1. Basic ~~design wind speed, V (mph),~~ tornado speed, V_T , miles per hour and *allowable stress design wind speed, V_{asd}* , as determined in accordance with Section 1609.3.1.
2. *Risk category.*
3. Effective plan area, A_e for tornado design in accordance with Chapter 32 of ASCE 7.
- ~~3-4.~~ Wind exposure. Applicable wind direction if more than one wind exposure is utilized.
- ~~4-5.~~ Applicable internal pressure coefficient coefficients, and applicable tornado internal pressure coefficients.
- ~~5-6.~~ Design wind pressures and their applicable zones with dimensions to be used for exterior component and cladding materials not specifically designed by the *registered design professional* responsible for the design of the structure, pounds per square foot (kN/m²). Where design for tornado loads is required, the design pressures shown shall be the maximum of wind or tornado pressures.

1605.1 General. Buildings and *other structures* and portions thereof shall be designed to resist the strength load combinations specified in ASCE 7, Section 2.3, the *allowable stress design* load combinations specified in ASCE 7, Section 2.4, or the alternative *allowable stress design* load combinations of Section 1605.2.

Exceptions:

1. The modifications to load combinations of ASCE 7 Section 2.3, ASCE 7 Section 2.4, and Section 1605.2 specified in ASCE 7 Chapters 18 and 19 shall apply.
2. Where the allowable stress design load combinations of ASCE 7 Section 2.4 are used, flat roof snow *loads* of 30 pounds per square foot (1.44 kN/m²) and *roof live loads* of 30 pounds per square foot (1.44 kN/m²) or less need not be combined with seismic load. Where flat roof snow *loads* exceed 30 pounds per square foot (1.44 kN/m²), 20 percent shall be combined with seismic loads.
3. Where the allowable stress design load combinations of ASCE 7 Section 2.4 are used, crane hook loads need not be combined with *roof live loads* or with more than three-fourths of the snow load or one-half of the wind loads.
4. Where design for tornado loads is required, the alternative allowable stress design load combinations of Section 1605.2 shall not apply when tornado loads govern the design.

1607.14 Roof loads. The structural supports of roofs and *marquees* shall be designed to resist wind and, where applicable, tornado, snow and earthquake *loads*, in addition to the *dead load* of construction and the appropriate *live loads* as prescribed in this section, or as set forth in Table 1607.1. The *live loads* acting on a sloping surface shall be assumed to act vertically on the horizontal projection of that surface.

1607.14.3 Awnings and canopies. *Awnings* and canopies shall be designed for uniform *live loads* as required in Table 1607.1 as well as for snow *loads* and wind and tornado *loads* as specified in Sections 1608 and 1609.

Add new text as follows:

1609.5 Tornado loads. The design and construction of Risk Category III and IV buildings and other structures located in the tornado-prone region as shown in Figure 1609.5 shall be in accordance with Chapter 32 of ASCE 7, except as modified by this code.



FIGURE 1609.5 TORNADO-PRONE REGION

Revise as follows:

~~1609.5~~ **1609.6 Roof systems.** Roof systems shall be designed and constructed in accordance with Sections ~~1609.5.1~~ 1609.6.1 through ~~1609.5.3~~ 1609.6.3, as applicable.

~~1609.5.1~~ **1609.6.1 Roof deck.** The *roof deck* shall be designed to withstand the greater of wind pressures or tornado pressures determined in accordance with ASCE 7.

~~1609.5.2~~ **1609.6.2 Roof coverings.** *Roof coverings* shall comply with Section ~~1609.5.1~~ 1609.6.1.

Exception: Rigid tile *roof coverings* that are air permeable and installed over a *roof deck* complying with Section ~~1609.5.1~~ 1609.6.1 are permitted to be designed in accordance with Section ~~1609.5.3~~ 1609.6.3.

Asphalt shingles installed over a *roof deck* complying with Section ~~1609.5.1~~ 1609.6.1 shall comply with the wind-resistance requirements of Section 1504.2 .

Add new text as follows:

1609.6.3 Rigid Tile. Wind and tornado loads on rigid tiles shall comply with Sections 1609.6.3.1 or 1609.6.3.2, as applicable.

Revise as follows:

~~1609.5.3~~ **1609.6.3.1 Rigid tile Wind loads.** Wind loads on rigid tile *roof coverings* shall be determined in accordance with the following equation:

$$M_a = q_h C_L b L L_a [1.0 - G C_p] \quad \text{(Equation 16-18)}$$

For SI:

$$M_a = \frac{q_h C_L b L L_a [1.0 - G C_p]}{1,000}$$

where:

b = Exposed width, feet (mm) of the roof tile.

C_L = Lift coefficient. The lift coefficient for concrete and clay tile shall be 0.2 or shall be determined by test in accordance with Section 1504.3.1.

$G C_p$ = Roof pressure coefficient for each applicable roof zone determined from Chapter 30 of ASCE 7. Roof coefficients shall not be adjusted for internal pressure.

L = Length, feet (mm) of the roof tile.

L_a = Moment arm, feet (mm) from the axis of rotation to the point of uplift on the roof tile. The point of uplift shall be taken at 0.76L from the head of the tile and the middle of the exposed width. For roof tiles with nails or screws (with or without a tail clip), the axis of rotation shall be taken as the head of the tile for direct deck application or as the top edge of the batten for battened applications. For roof tiles fastened only by a nail or screw along the side of the tile, the axis of rotation shall be determined by testing. For roof tiles installed with battens and fastened only by a clip near the tail of the tile, the moment arm shall be determined about the top edge of the batten with consideration given for the point of rotation of the tiles based on straight bond or broken bond and the tile profile.

M_a = Aerodynamic uplift moment, feet-pounds (N-mm) acting to raise the tail of the tile.

q_h = Wind velocity pressure, psf (kN/m²) determined from Section 26.10.2 of ASCE 7.

Concrete and clay roof tiles complying with the following limitations shall be designed to withstand the aerodynamic uplift moment as determined by this section.

1. The roof tiles shall be either loose laid on battens, mechanically fastened, *mortar* set or adhesive set.
2. The roof tiles shall be installed on solid sheathing that has been designed as components and cladding.
3. An *underlayment* shall be installed in accordance with Chapter 15.
4. The tile shall be single lapped interlocking with a minimum head lap of not less than 2 inches (51 mm).
5. The length of the tile shall be between 1.0 and 1.75 feet (305 mm and 533 mm).
6. The exposed width of the tile shall be between 0.67 and 1.25 feet (204 mm and 381 mm).
7. The maximum thickness of the tail of the tile shall not exceed 1.3 inches (33 mm).
8. Roof tiles using *mortar* set or adhesive set systems shall have not less than two-thirds of the tile's area free of *mortar* or adhesive contact.

Add new text as follows:

1609.6.3.2 Tornado loads. Tornado loads on rigid tile roof coverings shall be determined in accordance with Section 1609.6.3.1, replacing q_h with q_{hT} and (GC_p) with $K_{vT}(GC_p)$ in Equation 16-18, where:

q_{hT} = tornado velocity pressure, psf (kN/m²) determined in accordance with Section 32.10 of ASCE 7.

K_{vT} = tornado pressure coefficient adjustment factor for vertical winds, determined in accordance with Section 32.14 of ASCE 7.

Revise as follows:

2308.2.3 Allowable loads. *Loads* shall be in accordance with Chapter 16 and shall not exceed the following:

1. Average *dead loads* shall not exceed 15 psf (718 N/m²) for combined roof and ceiling, *exterior walls*, floors and partitions.

Exceptions:

1. Subject to the limitations of Section 2308.6.10, stone or masonry *veneer* up to the less of 5 inches (127 mm) thick or 50 pounds per square foot (2395 N/m²) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2439) permitted for *gable ends*.
 2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code.
2. *Live loads* shall not exceed 40 psf (1916 N/m²) for floors.

Exception: *Live loads* for concrete slab-on-ground floors in *Risk Categories* I and II shall be not more than 125 psf.

3. Ground snow *loads* shall not exceed 50 psf (2395 N/m²).
4. Where design for tornado loads is required, tornado loads on the main wind force resisting system and all components and cladding shall not exceed the corresponding wind loads on these same elements.

ASCE/SEI

American Society of Civil Engineers Structural Engineering Institute
1801 Alexander Bell Drive
Reston, VA 20191

7-22

Minimum Design Loads and Associated Criteria for Buildings and Other Structures

Reason Statement: This proposal is coming from the Resiliency Sub-workgroup.

This proposal is a coordination proposal to bring the 2024 IBC up to date with the provisions of the 2022 edition of ASCE/SEI 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-22). ASCE 7 will be updated to the 2022 edition from the 2016 edition as an Administrative update in the 2024 I-Codes.

This proposal includes technical updates as well as editorial coordination. The specific changes to each section included in this proposal is outlined below, and a detailed summary of the technical updates are explained below that:

Section 202 Definitions:

Updates to Nominal Loads, Essential Facilities, and Risk Category to include tornadoes.

Section 1602.1 Notations: Add new term V for tornado speeds.

Section 1603.1.4 Wind design data: Modifies section to include tornado speed and applicable internal pressures to be included on the construction drawings.

Section 1605.1 General: Adds new Exception 4 to exclude the use of the Alternative allowable stress design load combinations in Section 1605.2 when tornado loads govern the design.

Section 1607.14 Roof loads; Section 1607.14.3 Awnings and canopies: Modifies section to include tornado.

Section 1609.5 Tornado Loads: Added new section for charging language for tornado loads as well as a new Figure 1609.5 Tornado Prone Region to determine where tornado loads must be considered, per ASCE 7-22 Chapter 32.

Section 1609.5 Roof systems: This is to update the section number to 1609.6 after adding the new section 1609.5 for Tornado loads.

Section 1609.5.1 Roof deck: This updates to the new section number of 1609.6.1 and clarifies the requirement to be the greater of wind or tornado pressures for roof deck design.

Section 1609.5.2 Roof coverings: This updates the new section number 1609.6.2 as well as updates the pointers to the new section numbers.

Section 1609.5.3 Rigid Tile: This updates to the new section number of 1609.6.3 as well as adds new section 1609.6.3.1 Wind loads and 1609.6.3.2 Tornado loads to differentiate the requirements for wind and tornado. Also the new section 1609.6.3.2 for tornado loads clarifies the terms to be used in Equation 16-18 as well as adds pointers to ASCE 7 Chapter 32.

Section 2308.2.3 Allowable loads: This adds a requirement that allowable loads for conventional light-frame construction shall not be used on any portion of the design where tornado loads govern. This is written to specifically address only the portions of the design - specific to each element - where the loads are governed by tornado loads and does not intend to exclude the rest of the project that is not governed by tornado loads.

TECHNICAL REASON STATEMENT:

Overview

Tornado hazards have not previously been considered in the design of conventional buildings, despite the fact that tornadoes and tornadic storms cause more fatalities than hurricanes and earthquakes combined (NIST 2014) and more catastrophe insured losses than hurricanes and tropical storms combined (Insurance Information Institute 2021). This gap is addressed for the first time in ASCE 7-22, which now includes requirements for tornado loads. The tornado hazard maps and load methodology are based on a decade of research and development led by the National Institute of Standards and Technology (NIST), in collaboration with ASCE, following the record 2011 tornado season (1,691 tornadoes causing 553 fatalities). ASCE 7-22 requirements for tornado loads apply to Risk Category III and IV buildings and other structures sited in the tornado-prone region, which is approximately equal to the area of the U.S. east of the Continental Divide.

The tornado loads specified in the new Chapter 32 provide reasonable consistency with the reliability delivered by the existing criteria in ASCE 7 Chapters 26 and 27 for the Main Wind Force Resisting System (MWFRS), using the same return periods as the basic wind speed maps in Chapter 26 for Risk Category III and IV facilities (1,700 and 3,000 years, respectively). At return periods of 300 and 700 years (used for wind speeds with Risk Category I and II structures), tornado speeds are generally so low that tornado loads will not control over Chapter 26 wind loads. Therefore, design for tornadoes is not required for Risk Category I and II buildings and other structures.

ASCE 7-22 tornado design speeds for Risk Category III and IV structures range from 60 to 138 mph, depending on geographic location, Risk Category, and effective plan area (which is a function of the building footprint size and shape). This approximately corresponds to the speeds for Enhanced Fujita Scale EF0- EF2 tornadoes, which are not the most intense tornadoes but they are the most common. During the period from 1995 to 2016, over 89% of all reported tornadoes were EF0-EF1, and 97% were in the range of EF0-EF2. Furthermore, most of the area impacted by a tornado does not experience the maximum winds speeds on which the tornado is rated. For example, in the 2011 EF-5 tornado that damaged or destroyed approximately 8,000 buildings in Joplin, Missouri, an estimated 72% of the area swept by the tornado experienced EF0-EF2 winds, while just 28% experienced EF3 and greater winds (NIST 2014). It should also be noted that while property losses per individual tornado increase dramatically with increasing EF number, the aggregate losses caused by all EF1 tornadoes are very similar in magnitude to aggregate losses for all EF2s, for all EF3s, for all EF4s, and for all EF5s (NIST 2014). This is due to the fact that there are so many more lower-intensity tornadoes; e.g., only 59 of the nearly 66,000 recorded tornadoes since 1950 have been rated as EF-5.

To make it very clear that the ASCE 7 tornado provisions are not intended to provide protection from the most violent tornadoes, a large User Note on the first page of the Tornado Load chapter advises readers as follows:

Options for protection of life and property from more intense tornadoes include construction of a storm shelter and/or design for longer-return-period tornado speeds as provided in Appendix G, including performance-based design. A building or other structure designed for tornado loads determined exclusively in accordance with Chapter 32 cannot be designated as a storm shelter without meeting additional critical requirements provided in the applicable building code and ICC 500, the ICC/NSSA Standard for the Design and Construction of Storm Shelters. See Commentary Section C32.1.1 for an in-depth discussion on storm shelters. (ASCE 7-22 Section 32.1.1)

The referenced commentary section explains that life safety protection against the most violent tornadoes requires a tornado shelter that meets the ICC 500 Standard for Design and Construction of Storm Shelters (ICC 2020), or a tornado safe room meeting FEMA P-361 guidelines (FEMA 2021; note that Safe Rooms must meet all ICC 500 requirements plus additional FEMA Funding Criteria). Tornado hazard criteria for ICC 500 and FEMA P-361 are much more stringent than ASCE 7, reflecting the purpose to provide 'near-absolute life safety protection' as described by FEMA (2021). For example, the tornado shelter design speed in the central US is 250 mph. This compares to ASCE 7 speeds of 78-124 mph for Risk Category III and 95-138 mph for Risk Category IV, where the lower and upper values in the ranges correspond to 1 ft² and 4 million ft² effective plan areas, respectively.

Tornado Hazards

Among the many reasons that building codes and standards have not previously required design for tornado hazards is the misperception that tornadoes are too rare. As seen in Figure 1, in recent decades there have been an average of 1,251 reported tornadoes per year. The apparent smaller numbers of tornadoes from the 1950s through the early 1990s is primarily due to reporting issues, before there were doppler radar networks, cell phones, and trained spotter networks. Even today, many tornadoes in areas of low population density go unreported, in a well-known effect called population bias. There are less tornadoes per square mile per year recorded in very rural areas compared to suburban and urban areas in the same region of the country. The average annual frequency of tornadoes per state is shown in Figure 2, with the majority of tornadoes occurring in the Central and Southeast states.

Although the peak months for tornado activity in the US are in the spring, tornadoes can and do occur year-round. The end of 2021 yielded a record-setting December. The "Quad-State Tornado Outbreak" on December 10-11 spawned 68 tornadoes across 10 states, including two that tracked for more than 100 miles. This outbreak caused 90 confirmed fatalities. "The total damages and economic losses resulting from the historic tornado outbreak that impacted multiple states from the South to the Midwest could amount to \$18 billion, which would make it the costliest tornado outbreak in U.S. history," (AccuWeather 2021). The day after AccuWeather published that loss estimate, a derecho over the upper Midwest on December 15-16 caused another outbreak of 94 tornadoes. December yielded a total of 193 tornadoes across the Midwest and Southeast, including 42 EF-0, 96 EF-1, 42 EF-2, 6 EF-3, and 2 EF-4 tornadoes, with 5 more rated as unknown intensity (Figure 3).

While tornadoes have been recorded in all 50 states, the overwhelming majority occur east of the Continental Divide as seen in Figure 4. Even from this raw data, it is apparent why the tornado prone-region is east of the Rocky Mountains. The most intense tornadoes, shown in the darker colors, generally occur in the Central US, except near the Gulf Coast. Similarly, there are fewer intense tornadoes along the Atlantic Coast states. The coastal states have a large number of lower intensity tornadoes, many of them generated by hurricanes. In comparison, the Mountain and Western States experience relatively few tornadoes, and almost no strong (EF2-EF3) or violent (EF4-EF5) tornadoes.

Tornadoes can vary significantly in size. Path lengths range from as short as tens of yards to over a hundred miles. December's Quad-State Tornado tracked 166 miles across Arkansas, Missouri, Tennessee and Kentucky over the span of 4 hours. It was the 9 longest tornado on record (the longest being 219 miles). Path widths vary from around 10 yards to over a mile. The widest tornado on record occurred in El Reno, Oklahoma in 2013, with a maximum path width of 2.6 miles. The average path length for the December 2021 tornadoes was 8.8 miles, while the average maximum path width was 184 yards (Figure 3).

It is clear from the climatology that tornadoes are not rare events. For example, Oklahoma City has been struck by at least 141 tornadoes since 1940, for an average of nearly 2 per year (NWS 2022a). Another way to understand how frequent tornadoes actually are is to consider them from a building impacts perspective. Mining of event and episode narratives from NOAA's National Centers for Environmental Information (NCEI) Storm Events Database from 1993-2020 indicated at least 647 reports of schools being struck by tornadoes. Figure 5 shows the number of preK-12 schools per state that were struck by tornadoes. This average of more than 23 schools per year is a lower bound. The purpose of the Storm Events Database narratives is not to document school impacts per se, but rather summarize key features of storm and its overall impacts. Schools are often mentioned, but this is by no means a complete data source for school strikes. Review of other databases, post-storm reports, news searches, and other sources of information revealed many additional schools that were struck by tornadoes during this time period.

One recent example school impact: in a terrible way to ring in the new year, Veterans Memorial Middle School in Covington, Georgia was struck by an EF-1 tornado on December 31, 2021 (Figure 6). According to the National Weather Service, which conducted its assessment on New Year's Day, structural damage was observed at the school (NWS 2022b). "The tornado reached peak intensity of 90 mph as it hit Veterans Middle School removing significant amounts of siding and roofing from the gymnasium and sections of roof."

Tornado Load Provisions

The commentary chapter C32 of ASCE 7-22 provides descriptions and references supporting the development and application of the tornado load provisions. A brief summary is provided below.

Introduction.

The tornado hazard maps and load methodology were developed over the course of a decade of R&D by the National Institute of Standards and Technology, working closely with Applied Research Associates, Inc. and ASCE. The ASCE 7 tornado load provisions were developed by the ASCE 7 Tornado Task Committee in cooperation with the ASCE 7 Wind Load and Load Combinations Subcommittees. Three workshops were held (two at ASCE headquarters, in September 2015 and May 2019) in support of the tornado hazard map development. A broad range of stakeholders were informed about the detailed plans for map development at the first two workshops and advised on the details of the final methodology and draft maps at the last workshop. Stakeholder feedback from all workshops was incorporated into the final tornado hazard maps and load methodology.

Incorporation of Tornado Loads in ASCE 7. Tornado loads are treated completely separately from wind loads, hence their inclusion in a new chapter. While tornadoes are a type of windstorm, there are significantly different characteristics between tornadoes and other windstorms. For instance, tornadic winds have significant updrafts near the core; rapid atmospheric pressure changes can induce loads; and load combinations including tornado loads are not always the same as those including other wind loads (e.g., tornadoes are warm weather phenomena, so snow loads would not be included in combination with tornado loads). As a result of these considerations, tornado loads are treated separately from wind loads, not as a subset of wind loads. This is analogous to the separate treatment of flood loads and tsunami loads; both are hydrodynamic loads on buildings, but the nature of the hazard and the hazard-structure interaction is different enough that they are considered as completely separate loads.

Tornado Load Procedures. The tornado load procedures are based on the overall framework of the ASCE 7 wind load procedures. Tornado velocity pressure and design pressure/design load equations are similar to those found in Chapters 26-31 (exclusive of Chapter 28 Envelope Procedure, where the underlying methodology is incompatible with the tornado load approach). However, most of the terms used in the tornado load equations have some differences compared to their wind load counterparts, reflecting the unique characteristics of tornadic winds and windstructure interaction in contrast to straight-line winds. Several wind load parameters are not used in the tornado load chapter, while Chapter 32 also introduces a few new and significantly revised parameters.

Tornado Hazard Maps. Critical to development of the entire tornado load methodology was creation of a new generation of tornado hazard maps. The R&D needed to create these maps broke new ground in a number of areas. For example, novel approaches to quantify the well-known problems of population bias (where more tornadoes are reported in areas having greater population) and to capture regional variation in tornado climate were developed and applied. Tornado wind speeds associated with the Enhanced Fujita (EF) Scale intensity ratings were derived through engineering analysis instead of relying on the original EF Scale methodology, which was based on expert elicitation. The tornado hazard maps take spatial effects into account (since larger buildings are more likely to be struck by a tornado, tornado wind speeds increase with increasing plan (i.e., footprint) area of the building). These efforts resulted in a set of state-of-the-art probabilistic tornado hazard maps prescribing tornado design wind speeds for a wide range of return periods and target building plan area sizes, enabling tornado-resistant design of conventional buildings and infrastructure, including essential facilities.

The mapped tornado speeds represent the maximum 3-s gust produced by the translating tornado at a height of 33 ft anywhere within the plan area of the target building. The design tornado speeds for Risk Category III and IV buildings (for 1,700- and 3,000-year return periods, respectively) typically range from EF0-EF2 intensity, depending on geographic location, Risk Category, and plan size and shape. For protection from more violent tornadoes, performance-based design is explicitly allowed, and commentary on additional design requirements for storm shelters is provided. An appendix is included with tornado speeds for longer return periods. At return periods of 300 and 700 years, tornado speeds are generally so low that tornado loads will not control over Ch. 26 wind loads, hence design for tornadoes is not required for Risk Category I and II buildings and other structures.

Tornado Velocity Pressure. While the effects of terrain and topography on tornado wind speed profiles are not yet well understood, a review of near-surface tornadic wind measurements from mobile research radar platforms plus numerical and experimental simulations consistently showed wind speed profiles with greater horizontal wind speeds closer to the ground than aloft. The tornado velocity pressure profile ($K_{z, \text{TOR}}$) used has a uniform value of 1.0 from the ground up to a height of 200 ft, with a slightly smaller value at greater heights. In comparison, wind loads are based on an assumed boundary layer profile, where wind speeds are slower near the ground due to the effects of surface roughness.

Tornado Design Pressures. Atmospheric pressure change (APC) was found to have significant contributions to the tornado loads, particularly for large buildings with low permeability. The internal pressure coefficient was modified to also include the effects of APC. Since APC-related loads are not directionally dependent, the directionality factor was removed from the velocity pressure equation and added to the external pressure term (only) in the design pressure/load equations. The directionality factor K_d was modified through analysis of tornado load simulations on building MWFRS and components and cladding (C&C) systems. The resulting tornado directionality factor K_{dT} has values slightly less than the corresponding wind K_d values, with the exception of roof zone 1' (in the field of the roof), which increased. External pressure and force coefficients for both the MWFRS and C&C remain unchanged, but a modifier (K_{vT}) was added to account for experimentally determined increases to uplift loads on roofs caused by updrafts in the core of the tornado.

Reliability.

A reliability analysis was conducted to evaluate the tornado load provisions for the purpose of identifying appropriate return periods for the tornado hazard maps. This effort was conducted by a working group composed of members from both the ASCE 7-22 Load Combinations and Wind Load Subcommittees. Monte Carlo analyses (adapted from the ASCE 7-16 wind speed map return period analysis) were used, in which significant uncertainties for system demands and capacity were identified and quantified in the form of random variables with defined probability distributions. The results of this series of risk-informed analyses showed that the tornadic load criteria of Chapter 32 provided reasonable consistency with the reliability delivered by the existing criteria in Chapters 26 and 27 for MWFRS; therefore confirming that the 1,700- and 3,000- year return periods used for Risk Category III and IV wind hazard maps (respectively) in Chapter 26 were also suitable return periods to use for the tornado hazard maps.

Load Combinations.

In both the Strength and Allowable Stress Design (ASD) load combinations that maximize wind load effects, the wind load term W is replaced by the term $(W \text{ or } W_T)$, where W_T is the tornado load. Tornado loads do not appear in combinations that maximize other loads where wind is an arbitrary point-in-time load.

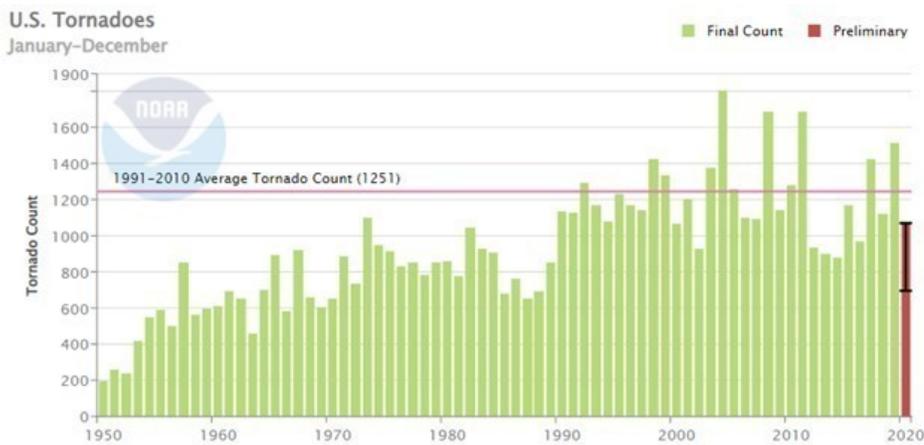


Figure 1. Number of reported tornadoes per year from 1950-2020 (NCEI 2022).

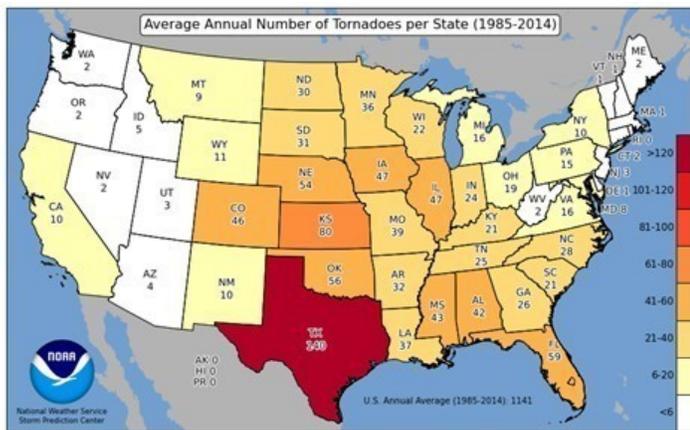


Figure 2. Average annual number of tornadoes per state (SPC 2022)

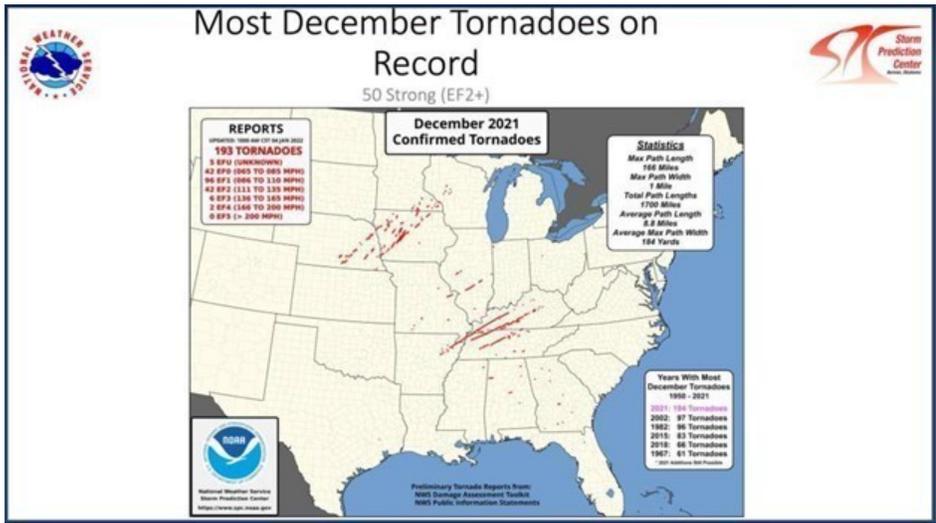


Figure 3. December 2021 produced a record 193 tornadoes across 17 states. (source: NOAA/NWS/Storm Prediction Center)

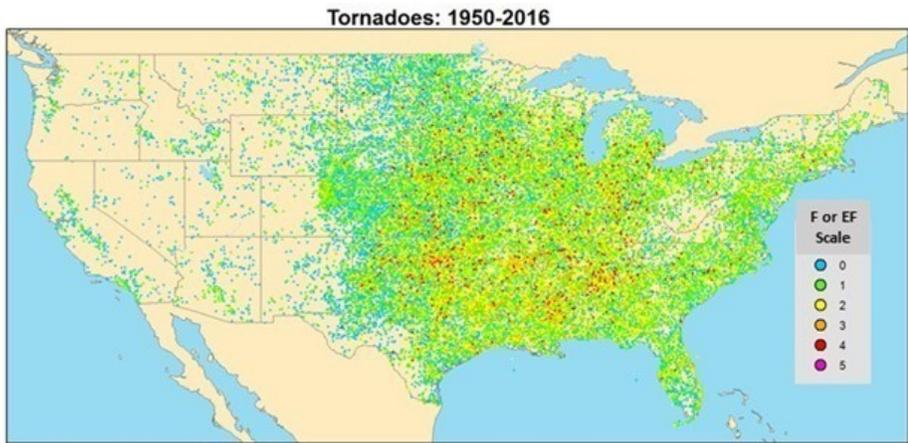


Figure 4. Map of tornado locations from 1950-2016 (source: NIST, using NOAA data).

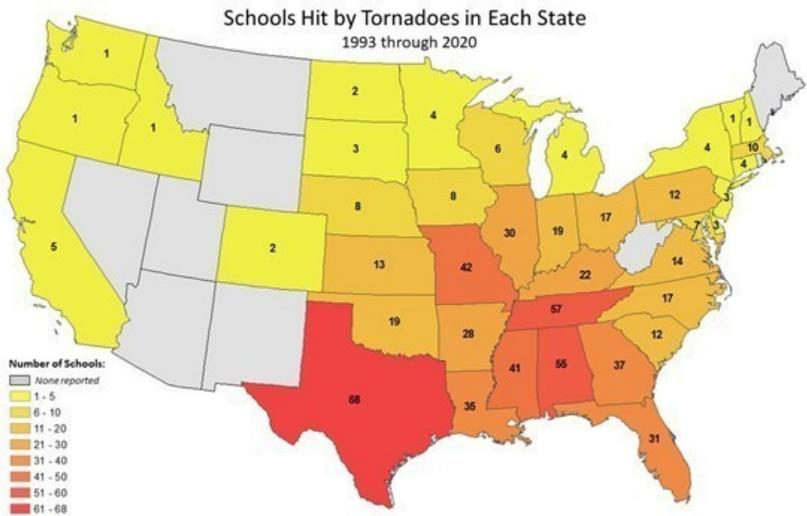


Figure 5. Lower bound for the number of schools struck by tornadoes, per state, for the 28-year period of 1993-2020 (source: NIST, using NOAA data).



Figure 6. EF-1 tornado in Covington, Georgia on New Year's Eve, 2021 (left); resulting damage to Veterans Memorial Middle School (right). (source: NWS)

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NWS. 2022b. NWSChat - PUBLIC INFORMATION STATEMENT, NATIONAL WEATHER SERVICE PEACHTREE CITY GA, 258 PM EST SAT JAN 1. <https://nwschat.weather.gov/p.php?pid=202201011958-KFFC-NOUS42-PNSFFC>

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Cost Impact: The code change proposal will increase the cost of construction

This proposal may increase the cost of construction for Risk Category III and IV buildings and other structures located in the tornado-prone region where tornado loads govern the design.

The ASCE 7-22 tornado load provisions in Section 32.5.2 include provisions to help identify many of the situations where tornado loads will not control any aspects of the wind load design. If the tornado speed $V < 60$ mph, tornado loads will not control over wind loads, so design for tornado loads is not required. Additionally, if the tornado speed is less than a certain percentage of the basic (non-tornado) wind speed, V , tornado loads will not control. For structures located in wind Exposure Category B or C, design for tornado loads is not required where $V < 0.5V$ or $V < 0.6V$, respectively (in this context, Exposure B means that the structure is surrounded on all sides by urban, suburban or wooded terrain, otherwise it would be considered Exposure C). The exposure category does not change the tornado loads, while wind loads in Exposure B are less than in Exposure C. Therefore, a building located in Exposure B is more likely to have tornado loads control over wind loads compared to the same building in Exposure C.

Whether or not tornado loads will ultimately control any aspects of the wind load design for a particular structure is dependent on a large number of factors, including but not limited to:

1. Tornado speed, which is a function of

- o Geographic location
 - o Risk Category
 - o Effective plan area, which depends on footprint size and shape
2. Basic wind speed, which is a function of
 - o Geographic location
 - o Risk Category
 3. Wind exposure category
 4. Building shape
 5. Roof geometry
 6. Roof height
 7. Enclosure classification
 8. Designation as an essential facility or not

Maps were created to show where design for tornado loads is not required, based on the tornado speed criteria in the previous paragraph.

Examples for a medium size Risk Category III facility and a very large Risk Category IV facility are shown in Figures 7 and 8, for both Exposures B and C. At locations where the tornado speed is greater than the specified percentage of the basic wind speed, design for tornado loads is required but may still not control. This is because the net pressure loading patterns on a building are different for tornadic versus non-tornadic winds, due to the differences in wind and wind-structure interaction characteristics which are reflected by factors 4 through 8 above.

For a medium-sized Risk Category III building, the tornado speeds are less than 60 mph across much of the tornado prone region (Figure 7).

Tornado loads are required only in the areas shaded with the warm colors, which spans roughly between north Texas, central Minnesota, and the central Carolinas. In contrast, tornado loads are required across most of the tornado-prone region for very large Risk Category IV facilities, except New England and small areas of south Florida and south Louisiana for Exposure C (Figure 8). In both figures, the darker reds indicate areas that tornado loads are more likely to exceed wind loads. In general, tornado loads are more likely to control at least some element(s) of the wind load design for buildings and other structures that have one or more of the following characteristics:

- are located in the central or southeast US, except near the coast (where hurricanes can dominate the extreme wind climate),
- are Risk Category IV,
- have large effective plan areas,
- are designated as Essential Facilities,
- are located in Exposure B,
- have low mean roof heights, and
- are classified as enclosed buildings for purposes of determining internal pressures.

A case study was conducted to compare MWFRS and C&C pressures between ASCE 7-16 (non-tornado) and ASCE 7-22 tornado provisions in the Dallas / Fort Worth area of Texas, and also consider the cost impacts. The case study considered four building types, an elementary school, a high school, a fire station, and a large hospital facility. The schools were Risk Category III, while the fire station and hospital were Risk Category IV essential facilities. All were new construction (no additions or renovations).

The elementary school was assumed to have an effective plan area of 100,000 ft² while the high school was 500,000 ft². For the two-story schools, the basic wind speed $V = 112$ mph, while the tornado speeds for the elementary and high school were $V = 90$ and 102 mph, respectively. Even though the tornado speeds were less than the basic wind speeds, tornado loads exceeded wind loads for many elements of the design. The high school experienced greater increases in design pressures compared to the elementary school, given its greater tornado speed. The tornado loads were generally larger than the corresponding wind loads, with the most significant impacts occurring where the magnitude of MWFRS and C&C pressure coefficients are relatively small. Tornado suction pressures on the leeward wall and uplift pressures in the field of the roof were more than double the corresponding wind loads in some instances. This was primarily due to the increased tornado internal pressure coefficient and the new pressure coefficient adjustment factor for vertical winds, which increases the uplift on the roof. These surfaces have the smallest magnitude pressures to begin with, so increases of internal pressure and other coefficients have more relative effect. MWFRS loads on the windward walls of all schools also increased (again, due to internal pressures), but less than on the leeward walls. The net lateral loads on the buildings were not significantly impacted (internal pressure cancels out). MWFRS and C&C tornado pressures on roof edges and corners generally increased for the Exposure B cases, but were similar to or smaller than the corresponding wind design pressures when the schools were in Exposure C.

Although specific percentage changes to design pressures are dependent on many factors as discussed previously, the trend for the greatest

relative impacts to occur on parts of the building or structure that have the smallest absolute values of wind loads holds true, as was the case for the fire station and hospital examples. The fire station and hospital were designed with effective plan areas of 15,000 ft² and 4 million ft² and heights of 20 ft and 80 ft (5-stories), respectively. The basic wind speed for Risk Category IV facilities in the DFW area is $V = 115$ mph. Tornado speeds for the

fire station and hospital were $V = 97$ and 123 mph, respectively. The relative impacts on the fire station were generally somewhere between those for the elementary and high schools. The hospital, with its much greater tornado speed due to the large effective plan area, experienced greater relative pressure differences. For example, C&C tornado pressures (for effective wind area of 200 ft) exceeded corresponding wind pressures across the four different flat roof pressure zones by 81 to 126% for Exposure B, and 39 to 73% for Exposure C. The tornado design pressures for the hospital were similar in magnitude to wind pressures for a comparable facility located in the hurricane-prone region along the Texas coast.

A study of the cost impacts for the schools showed that the structural cost increases were very modest. On the elementary school with a building cost of $\$20M$, the estimated cost increases were 0.24% and 0.14% for wind Exposure B and C, respectively. For the $\$200M$ high school, the cost increases were 0.13% and 0.08% for Exposures B and C. The study did not include cladding and appurtenance costs. It should be noted that Dallas-Ft. Worth location of this case study is part of the most highly impacted area of the country (as seen in Figures 7 and 8 below), having a combination of comparatively high tornado speeds and low basic wind speeds. The increases in design pressures and costs diminish rapidly outside of the parts of the central and southeast US that experience the most frequent and intense tornadoes and have the greatest tornado speeds, roughly approximated as the area between north Texas, west Iowa, and north Alabama.

Therefore, while tornado load design could increase loads and pressures for Risk Category III and IV structures in the tornado prone area, the impacts on cost of construction resulting in increases will most likely be small when compared to the overall project costs.

Resiliency Impact Statement: This proposal will increase Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: B1602-21

This proposal doesn't have any public comments.

B2403.6-21

Proponents: William Penniman (wpenniman@aol.com)

2021 International Building Code

Add new text as follows:

2403.6 Bird-Friendly Design and Construction. Within the Bird Activity Zone, the exterior envelope of any commercial or multifamily building, High-Risk Building Features and High-Risk Auxiliary Structures will be made of Bird Friendly Materials as defined in 2403.6.1.

2403.6.1 Definitions for Bird-Friendly Design and Construction. "Bird-Friendly Materials" means Bird-Friendly Glass and envelope materials that are neither transparent (such as traditional outside walls of wood, brick, concrete) nor highly reflective (such as polished metals or plastics). "Bird Activity Zone" means the zone from zero to 100 feet from grade.

"Glazing" means all glass, including spandrel glass, as well as any other materials, including but not limited to: plexiglass, polished metal, or materials that are transparent or highly reflective

"High-Risk Building Features" means transparent or highly reflective external surfaces of any of the following building features: skyways/skywalks; building connectors; outside corners where a bird can see in one side of the building and out the other ("flythrough conditions"), within 30 feet of the corner; parallel glass walls less than 50 feet apart; courtyards, including atria, open to bird entry; three floors of glazing adjacent to and above green roofs.

"Bird-Friendly Glass" means glass, other glazing materials or screening that meet any of the following conditions:

a. Frosted or opaque glass or glass with exterior surface (surface 1) obstructed and effectively covered by building-integrated structures that do not have gaps larger than 12" in any dimension, including non-glass double-skin facades, metal screens, fixed solar shading, exterior insect or solar screens, grilles, child guards and other features that meet these conditions.

b. Un-tinted glass with an outer total reflectance of $\leq 15\%$ that contains a pattern of visual markers that conforms to the following rules: (i) dots or other isolated solid shapes that are $\geq \frac{1}{4}$ " in diameter and are either \leq two-inches (2") apart in horizontal lines and \leq four inches (4") apart in vertical lines or \leq two-inches (2") apart if randomly distributed or (ii) horizontal lines that are $\geq \frac{1}{8}$ " in width and spaced ≤ 2 " apart or vertical lines that are $\geq \frac{1}{8}$ " in width and spaced ≤ 4 " apart.

c. Any product with a Threat Factor Rating of 30 or less as determined and published by the American Bird Conservancy. See www.birdsmartglass.org

"High-Risk Auxiliary Structures" means structures with glazing that poses significant collision risks to birds wherever they are found, including but not limited to:

a. Transparent or highly-reflective railings or barriers, including along balconies; noise or wind barriers (including parking structures); transportation (e.g., bus stops) or weather shelters;

b. Small, stand-alone buildings that present conditions that can be either transparent or reflective such as gazebos and external ticket booths;

c. Any other free-standing glass, plexiglass, or other clear, transparent, or highly-reflective free-standing structure.

CHAPTER 35 REFERENCED STANDARDS .: Add the following:

ABC American Bird Conservancy

Reason Statement: This proposal is supported by the Audubon Society of Northern Virginia.

Collisions with buildings kill up to 1 billion birds per year in the United States primarily due to the "invisibility" of clear glass to birds and due to reflections that appear to be attractive places to fly. <https://abcbirds.org/glass-collisions/why-birds-hit-glass/> This high annual loss of birds to building collisions has contributed to the significant decline that has been recorded in many bird populations during recent decades. The danger to birds exists for the full height of buildings, since migratory birds can hit a building at any level. Most collisions actually occur with glass on homes and buildings up to 10 stories because of the prevalence of such buildings, but taller buildings, though less common, pose a greater danger on a per-building basis. <https://abcbirds.org/glass-collisions/why-birds-hit-glass/> The amount of glass is the strongest predictor of bird collisions. <https://abcbirds.org/glass-collisions/architecture-planning/> The choice of design and glass can reduce collisions by a huge amount. <https://abcbirds.org/glass-collisions/architecture-planning/> Clear glass is a threat whether it is part of the building envelope or an extension of glass above the building walls or incorporated into skyways or balconies or even smaller auxiliary structures.

Although the risks extend to the tops of the tallest buildings, the American Bird Conservancy proposes defining the “bird activity zone” as being up to 100 feet above grade where both local flights and migrations occur. This proposal is generally modeled upon ABC’s proposal with some effort to simplify the language. It is important to note that portions of structures without glazing are not affected. Above-grade parking structures without glass, for example, are not affected.

Bird-friendly solutions may involve building design, the glass itself (e.g., frits or printed patterns, coatings, frosting) or physical structures (as simple as window screens, grills, shades or less glazing), <https://abcbirds.org/glass-collisions/architecture-planning/> (“Bird Friendly Design Guide”); <https://abcbirds.org/glass-collisions/why-birds-hit-glass/>; <https://abcbirds.org/glass-collisions/photo-gallery/>; <https://www.collidescape.org/>. As illustrated by the Javits Center window replacement, the choice of bird-friendly glass can reduce collisions by over 90%. <https://abcbirds.org/glass-collisions/architecture-planning/>

The range of bird-friendly glazing and design is growing as architects, builders and glass companies make concerted efforts to minimize building threats to birds. <https://abcbirds.org/glass-collisions/products-database/>

<https://nationalaudubon.app.box.com/s/lmf7vjbohuds6j92iqz1l1dzy8398ckj>

<https://www.featherfriendly.com/residential/> ;

<https://www.featherfriendly.com/commercial?hsLang=en> ;

<https://www.birdsavers.com/> ;

<https://www.windowfilms.ca/window-film-products/feather-friendly/> ;

<https://www.conveniencegroup.com/featherfriendly/feather-friendly/> ;

<https://www.walker-glass.com/resources/bird-safe-glass/>

A simple rule is the “2X4” standard: the 2 x 4 Rule is defined as a collision deterrence module based upon the physical profile of a bird in flight. Current research has established maximum module dimensions of 2” high x 4” wide. Some solutions, such as films meeting the 2X4 standard, can be applied to windows and effectively reduce collisions.

The American Bird Conservancy maintains and continuously updates a list of bird-friendly materials, which can be used for compliance in order to provide flexibility for builders and architects. The ABC list of bird friendly materials are rates products based on the hazard they pose for birds (“Threat Factor”). <https://abcbirds.org/glass-collisions/threat-factor-rating/> The data base is available in printed form or found at <https://abcbirds.org/glass-collisions/products-database/> ; www.birdsmartglass.org . As of November 2021, there were nearly 120 bird-friendly products that had been tested and found to pass the ABC’s “threat” standard.

Government bodies around the country have begun to address these issues with mandatory standards for bird-friendly construction. The ABC Threat Factor Rating is based upon testing and is commonly cited (e.g., by NYC and GSA) as a source of acceptable compliance standards.

Depending on designs and materials chosen, the solutions may be essentially invisible to occupants (e.g., UV patterns) or fit with the overall design pattern (e.g., insect screens on windows) or be such (e.g., frits) that occupants quickly get used to and see beyond the patterns.

Cost Impact: The code change proposal will increase the cost of construction

The proposed provision may, but need not, increase building costs. See <https://abcbirds.org/glass-collisions/architecture-planning/> (“Bird Friendly Design Guide”: “New construction can incorporate from the beginning bird-friendly design strategies that are cost neutral.”).

Some approaches can raise costs of construction, since bird-friendly glass is somewhat more costly than traditional glass. However, patterns on glass are only one solution. Design decisions for new buildings can mitigate or eliminate increased costs. For example, design changes to reduce the glass areas can result in mitigate construction costs and also save energy costs with a more efficient building envelope. There are also more manufacturers of bird-friendly glass and other bird-friendly solutions. In one example, construction of a building with 9,500 SF of glass incurred higher building costs of “less than a fifth of a percent of total construction costs”. <https://livingbuilding.kendedafund.org/2019/04/26/kendeda-buildings-bird-safe-glass-shockingly-huge-issue/> Many non-glass solutions, such as screens, sunshades or less glass, are cheaper and have other benefits.

Resiliency Impact Statement: This proposal will increase Resiliency

This proposal will enhance the resiliency and survival of both local and migratory birds, which are currently killed and injured by impacts to windows and other glazing of buildings. Buildings are the second leading cause of death to birds with up to 1 billion birds killed annually by striking buildings, mainly windows and other glass. The problem exists for both residential and commercial buildings, including low-rise buildings. Bird populations have declined substantially in the United States in the past 50 years, in significant part due to buildings and increased quantities of glass used in construction

By implementing the requirements for Bird-Friendly Materials in new construction, adoption of the proposal will substantially reduce bird injuries and mortality. Experience indicates that there could be a reduction of 90% or greater with full implementation.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B2403.6-21

This proposal doesn't have any public comments.

B3005.4-21

Proponents: Brian Byrne (bbyrne@pwcgov.org)

2018 Virginia Construction Code

Revise as follows:

3005.4 Machine and control rooms, control spaces, and machinery spaces. Elevator machine rooms, rooms and spaces housing elevator controllers, and machinery spaces outside of but attached to a hoistway that have openings into the hoistway shall be enclosed with *fire barriers* constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating shall not be less than the required rating of the hoistway enclosure. Openings in the *fire barriers* shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors.

Exceptions:

1. ~~Where~~ For other than fire service access elevators and occupant evacuation elevators, where elevator machine rooms, rooms and spaces housing elevator controllers, and machinery spaces do not abut and do not have openings to the hoist-way enclosure they serve, the *fire barrier* constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both, shall be permitted to be reduced to a 1-hour fire-resistance rating.
2. ~~For other than fire service access elevators and occupant evacuation elevators, in~~ buildings four stories or less above grade plane when elevator machine rooms, rooms and spaces housing elevator controllers, and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the elevator machine rooms, rooms and spaces housing elevator controllers, and machinery spaces are not required to be *fire-resistance rated*.

Reason Statement: This change correlates the VA exceptions with the IBC requirements for fire service access elevators and occupant evacuation elevators.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change correlates code sections and is not a technical change.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency
This change correlates code sections and is unrelated to resiliency.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B3005.4-21

This proposal doesn't have any public comments.

B3006.1-21

Proponents: Daniel Willham (daniel.willham@fairfaxcounty.gov)

2018 Virginia Construction Code

Revise as follows:

SECTION 3006 ELEVATOR LOBBIES AND HOISTWAY OPENING PROTECTION. ~~Deleted~~

2021 International Building Code

SECTION 3006 ELEVATOR LOBBIES AND HOISTWAY OPENING PROTECTION

Revise as follows:

3006.1 General. ~~Where provided to comply with applicable requirements set forth elsewhere in this code, elevator~~ Elevator hoistway openings and enclosed elevator lobbies shall be provided in accordance with the following:

1. Where hoistway opening protection is required by Section 3006.2, such protection shall be in accordance with Section 3006.3.
2. Where enclosed elevator lobbies are required for underground buildings, such lobbies shall comply with Section 405.4.3.
3. Where an *area of refuge* is required and an enclosed elevator lobby is provided to serve as an *area of refuge*, the enclosed elevator lobby shall comply with Section 1009.6.
4. Where fire service access elevators are provided, enclosed elevator lobbies shall comply with Section 3007.6.
5. Where occupant evacuation elevators are provided, enclosed elevator lobbies shall comply with Section 3008.6.

Reason Statement: The intent of this proposal is to fix several broken links to the requirements in this section from other sections in this code that resulted from this entire section being deleted by state amendment. Instead of repeating these requirements in each of the other individual sections that reference requirements in 3006, this proposal adds 3006 back but with revised charging language that does not explicitly require elevator lobbies to be provided in buildings but does provide criteria for when that option is chosen as a way to comply with other sections of this code. This does not require elevator lobbies to comply with this section if only provided voluntarily and not provided to meet an exception or other requirement elsewhere in the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal is to correct broken code language and will not affect construction cost.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency. This proposal is not related to resiliency.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B3006.1-21

This proposal doesn't have any public comments.

Proposal # 1098

B3007.6-21

Proponents: Daniel Willham (daniel.willham@fairfaxcounty.gov)

2018 Virginia Construction Code

Revise as follows:

3007.6 Fire service access elevator lobby. The fire service access elevator shall open into an enclosed fire service access elevator lobby in accordance with Sections 3007.6.1 through 3007.6.5. Egress is permitted through the enclosed elevator lobby in accordance with Item 1 of Section 1016.2.

Exception: Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to be protected in accordance with ~~Section 3006.3 of the International Building Code~~ one of the following:

1. An enclosed elevator lobby shall be provided at each

floor to separate the elevator hoistway shaft enclosure doors from each floor by fire partitions in

accordance with Section 708. In addition, doors

protecting openings in the elevator lobby enclosure

walls shall comply with Section 716.2.2.1 as required

for corridor walls. Penetrations of the enclosed

elevator lobby by ducts and air transfer openings

shall be protected as required for corridors in accordance with Section 717.5.4.1.

2. An enclosed elevator lobby shall be provided at each

floor to separate the elevator hoistway shaft enclosure doors from each floor by smoke partitions in

accordance with Section 710 where the building is

equipped throughout with an automatic sprinkler

system installed in accordance with Section 903.3.1.1

or 903.3.1.2. In addition, doors protecting openings

in the smoke partitions shall comply with Sections

710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of

the enclosed elevator lobby by ducts and air transfer

openings shall be protected as required for corridors

in accordance with Section 717.5.4.1.

3. Additional doors shall be provided at each elevator

hoistway door opening in accordance with Section

3002.6. Such door shall comply with the smoke and

draft control door assembly requirements in Section

716.2.2.1.1 when tested in accordance with UL 1784

without an artificial bottom seal.

4. The elevator hoistway shall be pressurized in accordance with Section 909.21

-

Reason Statement: Last cycle, this exception was revised to reference section 3006.3 of the International Building Code, since Virginia deletes that section from the Virginia Construction Code. Another code change to section 101.5 added language that redirects references to the International Building Code back to the Virginia Construction Code, effectively negating the prior approved change. This revision brings in the actual code language from the International Building Code to correct the broken link to the alternate provisions of the exception.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal corrects broken links in the code and does not impact construction costs.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency
This is not related to resiliency and has no impact.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: B3007.6-21

This proposal doesn't have any public comments.

B3008.1-21

Proponents: Brian Byrne (bbyrne@pwcgov.org)

2018 Virginia Construction Code

Revise as follows:

3008.1 General. Where elevators in *buildings* greater than 420 feet (128 m) in *building height* are to be used for occupant self-evacuation during fires, ~~all~~ passenger elevators for general public use shall comply with this section.

Reason Statement: The existing VA amendment does not correlate with Section 3008.1.1 of the IBC. This change maintains the VA amendment limiting the applicability of occupant evacuation elevator (OEE) requirements to buildings over 420 feet in building height while correlating with Section 3008.1.1 of the IBC for determining the number of available OEEs based on an egress analysis.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This change correlates code sections and is not a technical change.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency. This change correlates code sections and is unrelated to resiliency.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: BB3008.1-21-21

This proposal doesn't have any public comments.

B3302.4-21

Proponents: VFSB Codes and Standards Committee (amilliken@staffordcountyva.gov)

2021 International Building Code

Add new text as follows:

3302.4 Separations between construction areas. Separations used in Type I and Type II construction to separate construction areas from occupied portions of the building shall be constructed of materials that comply with one of the following:

1.Noncombustible materials.

2.Materials that exhibit a flame spread index not exceeding 25 when tested in accordance with ASTM E84 or UL 723.

3.Materials exhibiting a peak heat release rate not exceeding 300 kW/m²when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m²in the horizontal orientation on specimens at the thickness intended for use

3302.5 Fire safety requirements for buildings of Types IV-A, IV-B, and IV-C construction. Buildings of Types IV-A, IV-B and IV-C construction designed to be greater than six stories above grade plane shall comply with the following requirements during construction unless otherwise approved by the building code official:

1.Standpipes shall be provided in accordance with Section 3311.

2.A water supply for fire department operations, as approved by the fire code official and the fire chief.

3.Where building construction exceeds six stories above grade plane and noncombustible protection is required by Section 602.4 at least one layer of noncombustible protection shall be installed on all building elements on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

Exception:Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

4.Where building construction exceeds six stories above grade plane, required exterior wall coverings shall be installed on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

Exception:Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

Revise as follows:

[F] 3312.1 Completion before occupancy. In buildings where an *automatic sprinkler system* is required by this code, it shall be unlawful to occupy any portion of a building or structure until the *automatic sprinkler system* installation has been tested and *approved*, except as provided in Section ~~411.3~~ 116.1.1.

[F] 3313.1 Where required. An *approved* water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible building materials arrive on the site, on commencement of vertical combustible construction, and on installation of a standpipe system in buildings under construction, in accordance with ~~Sections 3313.2 through 3313.5~~ the Virginia Statewide Fire Prevention Code.

Exception: The *fire code official* is authorized to reduce the fire flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire flow requirements is impractical.

Delete without substitution:

[F] 3313.2 Combustible building materials. When combustible building materials of the building under construction are delivered to a site, a minimum fire flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used to provide this fire flow supply shall be within 500 feet (152 m) of the combustible building materials, as measured along an approved fire apparatus access lane. Where the site configuration is such that one fire hydrant cannot be located within 500 feet (152 m) of all combustible building materials, additional fire hydrants shall be required to provide coverage in accordance with this section.

[F] 3313.3 Vertical construction of Types III, IV and V construction. Prior to commencement of vertical construction of Type III, IV or V buildings that utilize any combustible building materials, the fire flow required by Sections 3313.3.1 through 3313.3.3 shall be provided, accompanied by fire hydrants in sufficient quantity to deliver the required fire flow and proper coverage.

[F] 3313.3.1 Fire separation up to 30 feet. Where a building of Type III, IV or V construction has a *fire separation distance* of less than 30 feet (9144 mm) from property lot lines, and an adjacent property has an *existing structure* or otherwise can be built on, the water supply shall provide either a minimum of 500 gallons per minute (1893 L/m), or the entire fire flow required for the building when constructed, whichever is greater.

[F] 3313.3.2 Fire separation of 30 feet up to 60 feet. Where a building of Type III, IV or V construction has a *fire separation distance* of 30 feet (9144 mm) up to 60 feet (18 288 mm) from property lot lines, and an adjacent property has an *existing structure* or otherwise can be built on, the water supply shall provide a minimum of 500 gallons per minute (1893 L/m), or 50 percent of the fire flow required for the building when constructed, whichever is greater.

[F] 3313.3.3 Fire separation of 60 feet or greater. Where a building of Type III, IV or V construction has a fire separation of 60 feet (18 288 mm) or greater from a property lot line, a water supply of 500 gallons per minute (1893 L/m) shall be provided.

[F] 3313.4 Vertical construction, Types I and II construction. If combustible building materials are delivered to the construction site, water supply in accordance with Section 3313.2 shall be provided. Additional water supply for fire flow is not required prior to commencing vertical construction of Type I and II buildings.

[F] 3313.5 Standpipe supply. Regardless of the presence of combustible building materials, the construction type or the *fire separation distance*, where a standpipe is required in accordance with Section 3313, a water supply providing a minimum flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used for this water supply shall be located within 100 feet (30 480 mm) of the fire department connection supplying the standpipe.

Reason Statement: Clean up of Chapter 33 Fire Safety During Construction to relocate construction provisions from the SFPC and correlate better with the SFPC and VEBC. Sections 3309.3 and 3309.4 are relocating the deleted construction sections from the SFPC. Section 3312.1 corrects the reference to 116.1.1 for temporary occupancy. Section 3313.1 is revised with 2021 language and references the SFPC for fire flow requirements. It also includes deleting sections 3313.2 through 3313.5 which are to be in the SFPC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost impact.

Resiliency Impact Statement: This proposal will increase Resiliency
By improving Chapter 33 of the VCC, the resiliency of communities is increased by protecting them from the hazards associated with poor fire safety practices during construction.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: B3302.4-21

This proposal doesn't have any public comments.

Proposal # 972

BF 202-21

Proponents: Mary Koban (mkoban@ahrinet.org)

2021 International Fire Code

Revise as follows:

FLAMMABLE GAS. A material which is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a *boiling point* of 68°F (20°C) or less at 14.7 psia (101 kPa)] ~~which is subdivided as follows:~~

1.

~~Is~~

Category 1A

- ~~1. Is~~ A gas which is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air; or
- ~~2. Has~~ A gas with a flammable range at 14.7 psia (101 kPa) with air of not less than 12 percent, regardless of the lower

~~limit.~~

limit, unless data shows compliance with Category 1B

2. Category 1B.

A gas which meets the flammability criteria for Category 1A, is not pyrophoric or chemically unstable, and meets one or more of the following:

1. A lower flammability limit of more than 6% by volume of air; or
2. A fundamental burning velocity of less than 3.9 in/s (10 cm/s).

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.

Where not otherwise specified, the term "flammable gas" includes both Category 1A and 1B.

2021 International Building Code

Revise as follows:

[F] FLAMMABLE GAS. A material that is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a *boiling point* of 68°F (20°C) or less at 14.7 psia (101 kPa)], ~~which also meets one of the following, subdivided as follows:~~

1. ~~Is~~ Category 1A.

1. A gas which is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air. ~~has~~

2.

~~Has~~

A gas with a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower

~~limit.~~

limit unless data shows compliance with Category 1B.

2. Category 1B.

A gas which meets the flammability criteria for Category 1A, is not pyrophoric or chemically unstable, and meets one or more of the following:

1. A lower flammability limit of more than 6% by volume in air; or
2. A fundamental burning velocity of less than 3.9 in/s (10 cm/s).

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.

Where not otherwise specified, the term "flammable gas" includes both Category 1A and 1B.

Reason Statement: In the 7th edition of the Global Harmonization System of Classification and Labelling of Chemicals (GHS) the classification of flammable gas was expanded. Flammable gases have three categories, Category 1A, Category 1B, and Category 2. The definition is revised to be consistent with the GHS. However, some of the subgroups of Category 1A are not identified since all of the subclass still fall within Category 1A. Not included in the definition are pyrophoric (flammable) gas and chemically unstable (flammable) gas. Within these two additional terms is a requirement that the gas must first meet the Category 1A definition. Hence, including these terms becomes unnecessary in the Fire Code. GHS also defines a Category 2 flammable gas. The definition of a Category 2 flammable gas is: Category 2 - A gas not meeting the criteria of Category 1A or 1B, which, at 68°F (20 °C) and a pressure of 14.7 psia (101 kPa), has a flammable range while mixed in air. It is recommended that ICC consider adding a note in the commentary that Category 2 flammable gases are not regulated as flammable gases in the Fire Code, however, GHS has a classification for such flammable gases.

The GHS flammable gas categories are noted as follows (the table from GHS could not be pasted into the VA.cdaccess):

- Category 1A flammable gases have a higher flammability and become explosive. These are the flammable gases typically understood such as propane, acetylene, and butane.
- Category 1B flammable gases have a lower flammability and are not inherently explosive, although all flammable gases can have deflagration under the right conditions. A typical Category 1B flammable gas would be difluoromethane. The gas has a lower flammable limit of 13.8 percent and an upper flammable limit of 29.9 percent. The burning velocity is 6.7 cm/s or 2.6 in/s. Other Category 1B flammable gases would include: 1,1,1-trifluoroethane; and 2,3,3,3-tetrafluoro-1-propene.
- Ammonia is a Category 2 flammable gas.

The last statement in the definition is to clarify that when not indicated, the term flammable gas applies to both Category 1A and Category 1B. When appropriate, the section in the code will state, "Category 1A flammable gas" or "Category 1B flammable gas."

This proposal was submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were

open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: <https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/>

This code proposal was accepted and approved for the 2024 IFC and IBC model codes

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This change neither increases or decreases the cost of construction. The change only impacts the classification of flammable gases, thus there are no other technical changes to the code through this revision of the definition.

Resiliency Impact Statement: This proposal will increase Resiliency

This code proposal will increase resiliency as it will allow users to align with upcoming changes to OSHA which are expected to align with GHS Purple Book 7.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: BF 202-21

This proposal doesn't have any public comments.

Proposal # 1116

BF608.9-21

Proponents: Mary Koban (mkoban@ahrinet.org)

2021 International Fire Code

Revise as follows:

608.9 Refrigerant detection. Machinery rooms shall be provided with a refrigerant detector with an audible and visible alarm. ~~Where ammonia is used as the refrigerant, detection shall comply with IAR 2. For refrigerants other than ammonia, refrigerant detection shall comply with Section 608.9.1. A detector, or a sampling tube that draws air to a detector, shall be provided at an approved location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an approved location where the concentration of refrigerant detected exceeds the lesser of the following:~~

1. The corresponding TLV-TWA values shown in the International Mechanical Code for the refrigerant classification.

2. Twenty-five percent of the lower flammable limit (LFL).

Detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 608.10.1.

Delete without substitution:

~~**608.9.1 Refrigerants other than ammonia.** A detector, or a sampling tube that draws air to a detector, shall be provided at an *approved* location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an *approved* location where the concentration of refrigerant detected exceeds the lesser of the following:~~

- ~~1. The corresponding TLV-TWA values shown in the *International Mechanical Code* for the refrigerant classification.~~
- ~~2. Twenty-five percent of the lower flammable limit (LFL).~~

~~Detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 608.10.1.~~

Revise as follows:

608.11 Emergency pressure control system. Permanently installed refrigeration systems in machinery rooms containing more than 6.6 pounds (3 kg) of flammable, toxic or highly toxic refrigerant ~~or ammonia~~ shall be provided with an emergency pressure control system in accordance with Sections 608.11.1 and 608.11.2.

608.13 Discharge and termination of pressure relief and purge systems. Pressure relief devices, fusible plugs and purge systems discharging to the atmosphere from refrigeration systems containing flammable, toxic or highly toxic refrigerants ~~or ammonia~~ shall comply with Sections 608.13.2 through ~~608.13.4.~~ and 608.13.3.

608.13.2 Flammable refrigerants. Systems containing more than 6.6 pounds (3 kg) of flammable refrigerants having a density equal to or greater than the density of air shall discharge vapor to the atmosphere only through an *approved* treatment system in accordance with Section ~~608.13.5~~ 608.13.4 or a flaring system in accordance with Section ~~608.13.6.~~ 608.13.5. Systems containing more than 6.6 pounds (3 kg) of flammable refrigerants having a density less than the density of air shall be permitted to discharge vapor to the atmosphere provided that the point of discharge is located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening or *exit*.

608.13.3 Toxic and highly toxic refrigerants. Systems containing more than 6.6 pounds (3 kg) of toxic or highly toxic refrigerants shall discharge vapor to the atmosphere only through an *approved* treatment system in accordance with Section ~~608.13.5~~ 608.13.4 or a flaring system in accordance with Section ~~608.13.6.~~ 608.13.5.

Delete without substitution:

~~**608.13.4 Ammonia refrigerant.** Systems containing more than 6.6 pounds (3 kg) of ammonia refrigerant shall discharge vapor to the atmosphere in accordance with one of the following methods:~~

- ~~1. Directly to atmosphere where the fire code official determines, on review of an analysis prepared in accordance with Section 104.8.2, that a health hazard would not result from atmospheric discharge of ammonia.~~
- ~~2. Through an approved treatment system in accordance with Section 608.13.5.~~
- ~~3. Through a flaring system in accordance with Section 608.13.6.~~
- ~~4. Through an approved ammonia diffusion system in accordance with Section 608.13.7.~~
- ~~5. By other approved means.~~

~~**Exception:** Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.~~

Revise as follows:

~~608.13.4~~ **608.13.5 Treatment systems.** Treatment systems shall be designed to reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDLH at the point of exhaust. Treatment systems shall be in accordance with Chapter 60.

~~608.13.5~~ **608.13.6 Flaring systems.** Flaring systems for incineration of flammable refrigerants shall be designed to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards. Incineration shall be automatic upon initiation of discharge, shall be designed to prevent blowback and shall not expose structures or materials to threat of fire. Standby fuel, such as LP-gas, and standby power shall have the capacity to operate for one and one-half the required time for complete incineration of refrigerant in the system. Standby electrical power, where required to complete the incineration process, shall be in accordance with Section 1203.

Delete without substitution:

~~**608.13.7 Ammonia diffusion systems.** Ammonia diffusion systems shall include a tank containing 1 gallon of water for each pound of ammonia (8.3 L of water for each 1 kg of ammonia) that will be released in 1 hour from the largest relief device connected to the discharge pipe. The water shall be prevented from freezing. The discharge pipe from the pressure relief device shall distribute ammonia in the bottom of the tank, but not lower than 33 feet (10 059 mm) below the maximum liquid level. The tank shall contain the volume of water and ammonia without overflowing.~~

Revise as follows:

608.14 Mechanical ventilation exhaust. Exhaust from mechanical ventilation systems serving refrigeration machinery rooms containing flammable, toxic or highly toxic refrigerants, ~~other than ammonia~~, capable of exceeding 25 percent of the LFL or 50 percent of the IDLH shall be equipped with *approved* treatment systems to reduce the discharge concentrations to those values or lower.

Exception: Refrigeration systems containing Group A2L complying with Section 608.18.

Reason Statement: This is a companion to the 2021 FCAC proposal that updates and correlates scoping of the IFC and IMC refrigeration system provisions. The 2021 IMC and all other model mechanical and fire codes no longer directly regulate ammonia refrigeration systems. Instead, they require compliance with ANSI/IIAR standards that provide comprehensive requirements for ammonia refrigeration, from system design through system decommissioning.

Revisions provided by this proposal duplicate that approach in the IFC. The 2020 edition of IIAR 2, which will be referenced by the 2024 IFC, serves as both a code and standard with respect to design of ammonia refrigeration systems, and it incorporates content that was previously handled by model fire and mechanical codes. A gap analysis between the IFC and IIAR 2 has been performed to verify that the 2020 edition of IIAR 2 includes 2021 IFC provisions.

This code proposal was accepted and adopted in the 2024 IFC code cycle

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The proposal removes overlapping requirements from the IFC that are provided by IIAR standards. IIAR standards already apply by specific references in the IFC, so there is no added cost associated with eliminating the overlap.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: BF608.9-21

This proposal doesn't have any public comments.

Proposal # 1117

BF608.17-21

Proponents: Mary Koban (mkoban@ahrinet.org)

2021 International Fire Code

Revise as follows:

[M] 608.17 **Electrical equipment.** Where refrigerant of Groups A2, A3, B2 and B3, as defined in the *International Mechanical Code*, are used, refrigeration machinery rooms shall conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70.

Exception-Exceptions:

1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1101.1.2, Exception 1 of the International Mechanical Code.
2. ~~Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 608.18.~~

Reason Statement: The second exception in the Fire Code and the exception in the Mechanical Code are no longer necessary with the revision in the 2021 International Mechanical Code regarding refrigerant classification. A2L is a separate group of refrigerants. Both sections state that the requirements apply to A2, A3, B2, and B3. Hence, A2L is not included in the requirements, so the two exceptions proposed for deletion no longer are needed.

This code proposal was accepted and adopted at the 2024 IFC code cycle.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature. As a result, there is no impact to the cost of construction.

Resiliency Impact Statement: This proposal will increase Resiliency
This code proposal will enable the use of low GWP refrigerants and help manufacturers meet the AIM Act.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: BF608.17-21

This proposal doesn't have any public comments.

BF608.17-21 (2)

Proponents: Mary Koban (mkoban@ahrinet.org)

2021 International Fire Code

Revise as follows:

[M] 608.17 Electrical equipment. Where refrigerant of Groups A2, A3, B2 and B3, as defined in the *International Mechanical Code*, are used, refrigeration machinery rooms shall conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70. ~~Exceptions~~
Exceptions:

~~1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1101.1.2, Exception 1 of the International Mechanical Code.~~

2. Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 608.18.

Reason Statement: Information regarding machinery rooms with ammonia are now contained within IIAR. The 2020 edition of IIAR 2, which will be referenced by the 2024 IFC, serves as both a code and standard with respect to design of ammonia refrigeration systems, and it incorporates content that was previously handled by model fire and mechanical codes. A gap analysis between the IFC and IIAR 2 has been performed to verify that the 2020 edition of IIAR 2 includes 2021 IFC provisions.

This code change was accepted and adopted for the 2024 IFC code cycle.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The proposal removes overlapping requirements from the IFC that are provided by IIAR standards. IIAR standards already apply by specific references in the IFC, so there is no added cost associated with eliminating the overlap.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

This code proposal will neither increase nor decrease resiliency. It updates the code by referring to the IIAR for ammonia usage.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: BF608.17-21

This proposal doesn't have any public comments.

BF911.1-21

Proponents: Mary Koban (mkoban@ahrinet.org)

2021 International Fire Code

Revise as follows:

TABLE 911.1 EXPLOSION CONTROL REQUIREMENTS^f

Portions of table not shown remain unchanged.

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems
Hazard Category			
Flammable gas	Gaseous	Not required	Required ^h
	Liquefied	Not required	Required ^h

- a. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2. See definition of "Combustible dust" in Chapter 2.
- b. Storage or use.
- c. In open use or dispensing.
- d. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
- e. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.
- f. Explosion venting is not required for Group H-5 Fabrication Areas complying with Chapter 27 and the International Building Code.
- g. Where explosion control is required in Section 1207.6.3.
- h. Not required for Category 1B Flammable Gases having a burning velocity not exceeding 3.9 in/s (10 cm/s).

3307.2.1 Pipe cleaning and purging. The cleaning and purging of flammable gas piping systems, including cleaning new or existing piping systems, purging piping systems into service and purging piping systems out of service, shall comply with NFPA 56.

Exceptions:

- 1. *Compressed gas* piping systems other than fuel gas piping systems where in accordance with Chapter 53.
- 2. Piping systems regulated by the *International Fuel Gas Code*.
- 3. Liquefied petroleum gas systems in accordance with Chapter 61.
- 4. Cleaning and purging of refrigerant piping systems shall comply with the International Mechanical Code.

2021 International Building Code

Revise as follows:

TABLE 414.5.1 EXPLOSION CONTROL REQUIREMENTS^{a, h}

Portions of table not shown remain unchanged.

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems ^b
HAZARD CATEGORY			
Flammable gas	Gaseous	Not Required	Required ^k
	Liquefied	Not Required	Required ^k

- a. See Section 414.1.3.
- b. See the *International Fire Code*.
- c. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2 of the *International Fire Code*. See definition of "Combustible dust" in Chapter 2.
- d. Storage or use.
- e. In open use or dispensing.
- f. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
- g. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.
- h. Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the *International Fire Code*.
- i. Where explosion control is required in Section 1207 of the *International Fire Code*.
- k. Not required for Category 1B Flammable Gases having a burning velocity not exceeding 3.9 in/s (10 cm/s).

Reason Statement: This change coordinates with the change in the definition of flammable gas. Explosive flammable gases do not include Category 1B flammable gases having a burning velocity of 3.9 in/s or less (Low BV). Table 911.1 has been modified accordingly. Category 1B low burning velocity flammable gases are excluded from the explosive flammable gas requirements. A reference to the International Mechanical Code has been added as an exception for the cleaning and purging of flammable gas piping systems requirements. Chapter 11 of the International Mechanical Code includes requirements for cleaning and purging using Category 1B low burning velocity flammable gases. This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: <https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/>. This code proposal was accepted and adopted in the 2024 IFC and IBC

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This code change neither increased nor decreased in the cost of construction. The change clarifies that the requirements in these sections are applicable to Category 1A flammable gases.

Resiliency Impact Statement: This proposal will increase Resiliency. This code proposal will increase resiliency by further enabling the use of low GWP refrigerants and allow manufacturers greater flexibility with regards to storage and handling of systems.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
 - Consensus Disapproval
 - Carry Over to Next Meeting
 - Carry over to Final
 - Non-Consensus
 - None
-

Public Comments for: BF911.1-21

This proposal doesn't have any public comments.

BF5003.1.1(1)-21

Proponents: Mary Koban (mkoban@ahrinet.org)

2021 International Fire Code

Revise as follows:

TABLE 5003.1.1(1) MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD^{a, j, m, n, p}

Portions of table not shown remain unchanged.

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ^b			USE-CLOSED SYSTEMS ^b			USE-OPEN SYSTEMS ^b			
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)		
Flammable gas	Gaseous	H-2	NA			NA	NA	NA	NA	NA		
	1A and 1B (High BV) ^f			NA	1,000 ^{d, e}						NA	1,000 ^{d, e}
	1B (Low BV) ^f				162,500 ^{d, e}							162,500 ^{d, e}
	Liquefied											
	1A and 1B (High BV) ^r			(150) ^{d, e}	NA						(150) ^{d, e}	NA
	1B (Low BV) ^r			(10,000) ^{d, e}							(10,000) ^{d, e}	

For SI: 1 cubic foot = 0.02832 m³, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

- a. For use of control areas, see Section 5003.8.3.
- b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.
- c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.
- d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e applies, the increase for both notes shall be applied accumulatively.
- e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d applies, the increase for both notes shall be applied accumulatively.
- f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.
- g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.
- h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.
- i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2.
- j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.
- k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.
- l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.
- m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

- n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.
- o. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
- p. The following shall not be included in determining the maximum allowable quantities:
 - 1. Liquid or gaseous fuel in fuel tanks on vehicles.
 - 2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.
 - 3. Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code*.
 - 4. Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code*.
 - 5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.
- q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2.
- r. "High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

TABLE 5003.1.1(3) MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA^{a, b, c, d}

MATERIAL	CLASS	STORAGE ^b			USE-CLOSED SYSTEMS ^b			USE-OPEN SYSTEMS ^b	
		Solid pounds (cubic feet)	Liquid gallons (pounds) ^d	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds) ^d	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds) ^d
Flammable gas	Gaseous	Not Applicable	Not Applicable		Not Applicable	Not Applicable		Not Applicable	Not Applicable
	1A and 1B (high BV) ^e			3,000			1,500		
	1B (low BV) ^e			195,000			97,500		
	Liquefied	(300)	Not Applicable		(150)	Not Applicable		Not Applicable	
	1A and 1BV (High BV) ^e								
	1B (low BV) ^e			20,000			10,000		

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m³.

- a. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.
- b. The aggregate quantities in storage and use shall not exceed the quantity listed for storage.
- c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage per single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area where such storage is in accordance with Section 5003.11.
- d. Quantities in parentheses indicate quantity units in parentheses at the head of each column.
- e. "High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

5003.8.3.5 Hazardous materials in Group M display and storage areas and in Group S storage areas. Hazardous materials located in Group M and Group S occupancies shall be in accordance with Sections 5003.8.3.5.1 through ~~5003.8.3.5.3~~ **5003.8.5.4**

Add new text as follows:

5003.8.3.5.4 Flammable gas. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single control area of a Group M occupancy, or in an outdoor control area, or stored in a single control area of a Group S occupancy is allowed to exceed the maximum allowable quantities per control area specified in Table 5003.1.1(1) without classifying the building or use as a Group H occupancy, provided the materials are stored and displayed in accordance with Section 5003.11.2.

Revise as follows:

5003.11 Maximum allowable quantity for Group M storage and display and Group S storage. The aggregate quantity of ~~nonflammable solid and nonflammable or noncombustible liquid~~ hazardous materials stored and displayed within a single *control area* of a Group M occupancy, or an outdoor *control area*, or stored in a single *control area* of a Group S occupancy, is allowed to exceed the *maximum allowable quantity per control area* indicated in Section 5003.1 where in accordance with Sections 5003.11.1 through ~~5003.11.3.11~~ and 5003.11.2.

5003.11.1 Nonflammable solid and nonflammable or noncombustible liquid hazardous materials Maximum allowable quantity per control area in Group M or S occupancies. The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single *control area* of a Group M occupancy, or an outdoor control area, or stored in a single control area of a Group S occupancy shall not exceed the amounts set forth in Table 5003.11.1.

Delete without substitution:

~~**5003.11.2 Maximum allowable quantity per outdoor control area in Group M or S occupancies.** The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single *outdoor control area* of a Group M occupancy shall not exceed the amounts set forth in Table 5003.11.1.~~

Revise as follows:

~~5003.11.3~~ **5003.11.1.1 Storage and display.** Storage and display shall be in accordance with Sections ~~5003.11.3.1~~ 5003.11.1 through ~~5003.11.3.11~~ 5003.11.1.11.

~~5003.11.3.1~~ **5003.11.1.1.1 Density.** Storage and display of solids shall not exceed 200 pounds per square foot (976 kg/m²) of floor area actually occupied by solid merchandise. Storage and display of liquids shall not exceed 20 gallons per square foot (0.50 L/m²) of floor area actually occupied by liquid merchandise.

~~5003.11.3.2~~ **5003.11.1.1.2 Storage and display height.** Display height shall not exceed 6 feet (1829 mm) above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet (2438 mm) above the finished floor in storage areas of Group M and Group S occupancies.

~~5003.11.3.3~~ **5003.11.1.1.3 Container location.** Individual containers less than 5 gallons (19 L) or less than 25 pounds (11 kg) shall be stored or displayed on pallets, racks or shelves.

~~5003.11.3.4~~ ~~5003.11.3.4~~ **5003.11.1.1.4 Racks and shelves.** Racks and shelves used for storage or display shall be in accordance with Section 5003.9.9.

~~5003.11.3.5~~ **5003.11.1.1.5 Container type.** Containers shall be *approved* for the intended use and identified as to their content.

~~5003.11.3.6~~ **5003.11.1.1.6 Container size.** Individual containers shall not exceed 100 pounds (45 kg) for solids or 10 gallons (38 L) for liquids in storage and display areas.

~~5003.11.3.7~~ **5003.11.1.1.7 Incompatible materials.** *Incompatible materials* shall be separated in accordance with Section 5003.9.8.

~~5003.11.3.8~~ **5003.11.1.1.8 Floors.** Floors shall be in accordance with Section 5004.12.

~~5003.11.3.9~~ **5003.11.1.1.9 Aisles.** Aisles 4 feet (1219 mm) in width shall be maintained on three sides of the storage or display area.

~~5003.11.3.10~~ **5003.11.1.1.10 Signs.** Hazard identification signs shall be provided in accordance with Section 5003.5.

~~5003.11.3.11~~ **5003.11.1.1.11 Storage plan.** A storage plan illustrating the intended storage arrangement, including the location and dimensions of aisles, and storage racks shall be provided.

Add new text as follows:

5003.11.2 Category 1B flammable gas with low burning velocity. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single control area of a Group M occupancy, or an outdoor control area, or stored in a single control area of a Group S occupancy shall not exceed the amounts set forth in Table 5003.11.2.

Table 5003.11.2 MAXIMUM ALLOWABLE QUANTITY OF LOW BURNING VELOCITY CATEGORY 1B FLAMMABLE GAS IN GROUP M AND S OCCUPANCIES PER CONTROL AREA^a

FLAMMABLE GAS CATEGORY	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA ^a	
	Sprinklered in accordance with Note b	Nonsprinklered
Category 1B (Low BV) ^d		
Gaseous	390,000 cu. ft.	195,000 cu. ft.
Liquefied	40,000 lbs. ^e	20,000 lbs.

For SI: 1 pound = 0.454 kg, 1 cu. ft. = 0.028 m³

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.

b. The building shall be equipped throughout with an approved automatic sprinkler system with minimum sprinkler design density of Ordinary Hazard Group 2 in the area where flammable gases are stored or displayed.

c. Where storage areas exceed 50,000 square feet in area, the maximum allowable quantities area allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to not more than 100 percent of the table amounts. Separation of control areas is not required. The aggregate amount shall not exceed 80,000 pounds.

d. "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

5003.11.2.1 Fire protection and storage arrangements. Fire protection and container storage arrangements for quantities of Category 1B flammable gases permitted by Table 5003.11.2 shall be in accordance with the all of the following:

1. Storage of the Category 1B flammable gases on shelves shall not exceed 6 feet (1829 mm) in height, and shelving shall be metal.

2. Rack storage, pallet storage or piles of the Category 1B flammable gas greater than 6 feet 6 inches (1981 mm) in height shall be provided with an automatic sprinkler system with a minimum design of Extra Hazard Group 1.

3. Combustible commodities shall not be stored above the Category 1B flammable gases.

4. Flammable liquids shall be separated from the Category 1B flammable gases by a distance 20 feet (6096 mm). The separation is permitted to be reduced to 10 feet (3048 mm) where secondary containment or diking is provided to retain a flammable liquid spill at a distance of 10 feet (3048 mm) from the Category 1B flammable gas storage.

Reason Statement: This change coordinates the requirements for flammable gas with the change in definition to "flammable gas." The change in definition results in two categories of flammable gas, Category 1A and Category 1B. The existing requirements in the code are based on Category 1A flammable gases. As a result, new requirements had to be developed to regulate Category 1B flammable gases. It should be noted that there is a distinction between Category 1B flammable gas based on the burning velocity.

The research on this code change is based on a burning velocity of 3.9 in/s (10 cm/s) or less. Higher burning velocity Category 1B flammable gases are not commercially available, hence there is no means of evaluating their performance. The changes to the table for the higher allowable quantities are for the Category 1B low burning velocity flammable gases. There is no change to the Category 1B high burning velocity flammable gases. A change is necessary to Tables 5003.1.1(1) and 5003.1.1(3) regarding the maximum allowable quantities for control area.

The approach that was taken is similar to the approach used in the code for other hazardous materials that have different classes or categories based on the hazard level of the material. The current requirements in the tables will continue to apply to Category 1A flammable gases. This requires the addition of the words "Category 1A and Category 1B (High BV)" to be added in front of the term "flammable gas." The new requirements for "Category 1B (Low BV)" flammable gases are based on a comparative analysis of the hazard of these flammable gases. The approach was to added limitations in the maximum allowable quantity table with a new section added that specifically regulates the requirements for storage in Use Group M and S.

It should be noted that other than Use Group H, the predominant storage location of flammable gases is in Use Group M and S buildings. Section 5803.1.1 of the Fire Code will continue to have restrictions on the storage and use of flammable gases in other Use Groups. A new Section 5003.11.2 and Table 5003.11.2 in the Fire Code will add specific requirements for Use Group M and S. A similar Section 414.2.5.3 will be added to the Building Code. In developing these limitations, a comparison of existing requirements was evaluated for other hazardous materials. An evaluation of various fire tests on Category 1B (Low BV) flammable gas also helped to establish the MAQ. A conservative value of 10,000 pounds of Category 1B (Low BV) flammable gas was established as the maximum for a nonsprinklered control area. Comparing the deflagration index, Category 1B (Low BV) range from 0.5 to 11 percent of the deflagration index of Category 1A flammable gases. The minimum ignition energy varies by as much at

58,000 times. The heat of combustion is between 6 and 19 percent of Category 1B (Low BV). Thus, the value selected is conservative but agreeable to industry. With the established base maximum, the value for a control area is double for a sprinklered control area. The special requirements for Use Group M and S are also doubled for a nonsprinklered control area. The maximum allowable quantity is double to 40,000 for a sprinklered control area in a Use Group M or S. The sprinklered control area storage maximum can double again when additional floor area is provided in the control area.

The appendices have been updated to correlate with the revisions to the MAQ table.**If the proposal reclassifying 1B Flammable Gases to association with the Group H-3 occupancy classification is successful, Tables 5003.1.1(1) and 307.1(1) will need to be revised so that the "GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED" row says "H-2 or H-3."

This proposal was submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: <https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/>

This code proposal was accepted and adopted for the 2024 IFC.

Cost Impact: The code change proposal will decrease the cost of construction

This code change reduces the cost of construction. By modifying the maximum allowable quantities for Category 1B flammable gas, the construction costs are lowered. The construction costs for Category 1A flammable gas remain unchanged, neither increased nor decreased in the cost of construction.

Resiliency Impact Statement: This proposal will increase Resiliency

This code proposal will provide users with the necessary guidelines for storing low GWP refrigerant. It will increase resiliency as users will be able to store larger quantities of low GWP refrigerants to meet the needs of distributors and other stakeholders.

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: BF5003.1.1(1)-21

This proposal doesn't have any public comments.

AD75-21

Proponents: Charles Littlefield (casey.littlefieldmcp@gmail.com)

2018 Virginia Building and Fire Code Related Regulations

Revise as follows:

13VAC5-31-75. Local building department.

A. In accordance with §§ 36-98.3 and 36-105 of the Code of Virginia, the local building department shall be responsible for the enforcement of this chapter and may charge fees for such enforcement activity. The total amount charged for any one permit to operate an amusement device or devices or the renewal of such permit shall not exceed the following, except that when a private inspector is used, the fees shall be reduced by 75%:

1. \$55 for each small mechanical ride or inflatable amusement device covered by the permit;
2. \$75 for each circular ride, institutional trampoline, or flat-ride less than 20 feet in height covered by the permit, except concession go-karts.

Concession go-kart fees shall not exceed \$300 per track, for tracks with up to 20 karts. An additional fee of up to \$10 may be charged for each additional kart in excess of 20;

3. \$100 for each spectacular ride covered by the permit that cannot be inspected as a circular ride or flat-ride in subdivision 2 of this subsection due to complexity or height, except zip lines.

Zip line fees shall not exceed \$150 for each zip line. For the purpose of this section, each portion from launch point to landing point shall be considered a separate zip line and each zip line between a launch point and landing point shall also be considered a separate zip line;

4. \$200 for each coaster covered by the permit that exceeds 30 feet in height;
5. \$400 for each coaster covered by the permit that exceeds 60 feet in height; and
6. The local building department may charge an additional fee for permits and inspections of generators and associated wiring for amusement device events. Generators subject to these fees are those used exclusively with amusement devices and that are inspected by the local building department. The fee per event shall not exceed \$165 and shall not exceed the actual cost to perform the inspection or inspections.

Exception: Small portable generators serving only cord and plug connected equipment loads are not subject to the fee.

Notwithstanding the fee limitations established in this section, the local building department shall be permitted to increase the fees up to 50% when requested to perform weekend or after-hour inspections. The local building department shall also be permitted to increase fees up to 50% when a reinspection is required.

1. B. Notwithstanding the provisions of subsection A of this section, when an amusement device is constructed in whole or in part at a site for permanent operation at that site and is not intended to be disassembled and moved to another site, then the local building department may utilize permit and inspection fees established pursuant to the USBC to defray the cost of enforcement. This authorization does not apply to an amusement device that is only being reassembled, undergoing a major modification at a site or being moved to a site for operation.
2. C. A permit application shall be made to the local building department at least five days before the date in which the applicant intends to operate an amusement device. The application shall include the name of the owner, operator or other person assuming responsibility for the device, a general description of the device including any serial or identification numbers available, the location of the property on which the device will be operated, and the length of time of operation. The permit application shall indicate whether a private inspector will be used. If a private inspector is not used, the applicant shall give reasonable notice when an inspection is sought and may stipulate the day such inspection is requested provided it is during the normal operating hours of the local building department. In addition to the information required on the permit application, the applicant shall provide proof of liability insurance of an amount not less than \$1 million per occurrence or proof of equivalent financial responsibility. The local building department shall be notified of any change in the liability insurance or financial responsibility during the period covered by the permit.
3. D. Notwithstanding the provisions of subsection C of this section, a permit application is not required for a small mechanical ride or an inflatable amusement device that has a certificate of inspection issued by any local building department in this Commonwealth either a six-month period for small mechanical rides or within a one-year period for inflatable amusement devices prior to the dates the small mechanical ride or inflatable amusement device is to be used, regardless of whether the device has been disassembled and moved to a new site. In such cases, the local building department shall be notified and provided with the information required on a permit application as listed in subsection C of this section at least three days prior to operation. In addition, and notwithstanding the provisions of subsection A of this section, the local building department shall be permitted to charge a \$50 inspection fee per event to the person notifying the local building department of an event where an inflatable amusement device is operating if the local building department chooses to inspect any or all of the inflatable amusement devices operating at that event. An inspection report shall be provided to the person notifying the local building department of the event if such an inspection is conducted.
4. E. Local building department personnel shall examine the permit application within five days and issue the permit if all requirements are met. A certificate of inspection for each amusement device shall be issued when the device has been found to comply with this chapter by a private inspector or by an inspector from the local building department. It shall be the responsibility of the local building department to verify that the private

inspector possesses a valid certificate of competence as an amusement device inspector from the Virginia Board of Housing and Community Development. In addition, local building department personnel shall be responsible for assuring that the certificate of inspection is posted or affixed on or in the vicinity of the device in a location visible to the public. Local building department personnel shall post or affix such certificates or permit the certificates to be posted or affixed by the private inspector. Permits shall indicate the length of time the device or devices will be operated at the site, clearly identify the device or devices to which it applies and the date of expiration of the permit. Permits shall not be valid for longer than one year, except that permits for small mechanical rides shall not be valid for longer than six months.

5. F. In addition to obtaining a certificate of inspection in conjunction with a permit application for amusement devices permanently fixed to a site, a new certificate of inspection shall also be obtained prior to the operation of an amusement device following a major modification, prior to each seasonal operation of a device, at least once during the operating season and prior to resuming the operation of a device following an order from a local building department to cease operation. This requirement shall not apply to small mechanical rides meeting the conditions outlined in subsection D of this section.
3. G. For amusement devices manufactured prior to 1978, the owner or operator shall have the information required by 10.1 through 10.6 of ASTM F1193 available at the time of inspection. In addition, the operator of any amusement device shall be responsible for obtaining all manufacturer's notifications, service bulletins and safety alerts issued pursuant to ASTM F770 and the operator shall comply with all recommendations and requirements set out in those documents. A copy of all such documents shall be made available during an inspection.
7. H. In the enforcement of this chapter, local building department personnel shall have authority to conduct inspections at any time an amusement device would normally be open for operation or at any other time if permission is granted by the owner or operator, to issue an order to temporarily cease operation of an amusement device upon the determination that the device may be unsafe or may otherwise endanger the public and to accept and approve or deny requests for modifications of the rules of this chapter in accordance with the modification provisions of the USBC.
3. I. In accordance with subdivision 7 of § 36-137 of the Code of Virginia, the local building department shall collect a 2.0% levy of fees charged for permits under this chapter and transmit it quarterly to DHCD to support training programs of the Virginia Building Code Academy. Localities that maintain individual or regional training academies accredited by DHCD shall retain such levy.
3. J. In accordance with § 36-98.3 of the Code of Virginia and 13VAC5-31-10 B, the procedures for violations of this chapter shall be as prescribed in the USBC.
3. K. In accordance with § 36-98.1 of the Code of Virginia, the Virginia Department of General Services (DGS) shall function as the local building department for the application of this chapter to amusement devices located on state-owned property. In accordance with §§ 36-98.2 and 36-114 of the Code of Virginia, appeals of the application of this chapter by the DGS shall be made directly to the State Building Code Technical Review Board. Further, as a condition of this chapter, such appeals shall be filed within 14 calendar days after receipt of the decision of DGS.
1. L. In addition to the provisions of this Chapter, riders, parents or guardians of riders, and operators shall also comply with Chapter 45 of Title §59.1 of the Code of Virginia, "The Amusement Device Rider Safety Act".

Reason Statement: Adding language into the VADR about the Patron Safety Act gives users the ability to cite specific code when an accident or injury occurs because of the actions of a patron or Rider. Most Jurisdictions in the State aren't aware this language actually exists so bringing it into the regulations assures that should an accident occur and it was determined that the patron or rider is a fault, proper language can be cited. This language also helps carnivals and fairs provide guidance when misbehaving patrons or riders don't follow established rules.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This Code change is for reference only and will not impact the cost of construction.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: AD75-21

This proposal doesn't have any public comments.

Proposal # 1153

IB120-21

Proponents: DHCD Staff

2018 Industrialized Building Safety Regulations

2018 Virginia Building and Fire Code Related Regulations

Revise as follows:

13VAC5-91-120. Unregistered industrialized buildings. The building official shall determine whether any unregistered industrialized building complies with this chapter and shall require any noncomplying unregistered building to be brought into compliance with this chapter. ~~The building official shall enforce all applicable requirements of this chapter including those relating to the sale, rental and disposition of noncomplying buildings. The building chapter in accordance with one of the following:~~

1. The building may be registered in accordance with 13VAC5-91-125

2. The building official may approve the unregistered building in accordance with the USBC. The building official may require submission of full plans and specifications for each building. Concealed parts of the building may be exposed to the extent necessary to permit inspection to determine compliance with the applicable requirements. The building official may also accept reports of inspections and tests from individuals or agencies deemed acceptable to the building official.

Reason Statement: The text was reworked to make it clearer that it is not a requirement to have unregistered industrialized buildings become registered and that building officials have some leeway when approving unregistered buildings in accordance with Code of Virginia §36-99.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies administrative procedures and will not affect cost.

Resiliency Impact Statement: This proposal will neither increase nor decrease Resiliency

Workgroup Recommendation

2021 Workgroups Workgroup Action: None

2021 Workgroups Reason:

Workgroup Action

- Consensus Approval
- Consensus Disapproval
- Carry Over to Next Meeting
- Carry over to Final
- Non-Consensus
- None

Public Comments for: IB120-21

This proposal doesn't have any public comments.

