



STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

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Final Cost Benefit Analysis for the 2021 International Fire Code

I. Code Adoption and Significant legislative Rules

1. Introduction

The Washington State Building Code Council (SBCC) is required to adopt and maintain the state building code, as provided in chapters 19.27, 19.27A, and 70.92 RCW, and the state legislature. The primary objective of the Council is to encourage consistency in the building code throughout the state of Washington and to maintain the building code consistent with the state's interest as provided in RCW 19.27.020. The statewide code adoption process is defined in WAC 51-04 and the Council by-laws. Since 1985, the Council has been responsible for the adoption to update to new editions of the model codes per RCW 19.27.074, including the International Fire Code (IFC). The IFC is updated every three years by the International Code Council (ICC). The code development process conducted by the model code organization is open to all interest groups within the design and construction industry and from governmental organizations.

The Council adopts the building codes in accordance with the Administrative Procedures Act (APA). The general procedures for rulemaking are laid out in part III of the Act (RCW 34.05.310 through RCW 34.05.395). Administrative rules governing the procedures for agency rulemaking have been adopted by the Office of the Code Reviser and are found at WAC 1-21-005 through WAC 1-21-180.

2. Adoption of 2021 International Fire Code.

The Council filed a rule to adopt the 2021 edition of the International Fire Code (IFC), (WAC 51-54A), on December 30, 2021. (WSR 22-13-093). The Preproposal Statement of Inquiry (CR 101) to initiate the development of the 2021 IFC, as adopted through WAC 51-54A, was filed as WSR 21-07-137 on March 24, 2021. On April 1, 2021, the Council opened a 60-day submittal period for proposals for statewide amendments to the 2021 IFC. All stakeholders and interested parties could submit proposals to meet the legislative goals. All proposals are submitted in writing on the appropriate form with the indicated supporting documentation. Each proponent is required to identify if the proposed amendment has an economic impact and estimate the costs and savings of the proposal on construction practices, users and/or the public, the enforcement community, and operation and maintenance.

The Council has adopted a definition of cost-effectiveness based on RCW 39.35 as recommended by Department of Commerce. A guide on how to evaluate cost-effectiveness is therefore defined by the Council as a code change that has a net present savings over a 50-year life cycle of a building utilizing the Life Cycle Cost Tool (LCCT) as developed by the Washington State Office of Financial Management (OFM). The methodology of the LCCT is based on the NIST Handbook 135 methodology and utilizes specific inputs as determined by the Council with guidance from the Washington State Department of Commerce. The cost effectiveness analysis uses the average useful life years from Appendix 7 of the BOMA Preventive Maintenance Guidebook for all building components that are evaluated. Each submitted code change proposal that is not editorial, or explanatory is required to include this analysis. The proponents are also allowed to use an alternate cost benefit analysis.

In considering amendments to the model code, the Council established and consulted with a technical advisory group (TAG), including representatives of appropriate state agencies, local governments, general contractors, building owners and managers, design professionals, utilities, and other interested parties. The TAG was tasked with evaluating the proposals, identifying the feasibility and whether it



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helped achieve the broader goals of ensuring buildings and facilities constructed in the state are safe and healthy for building occupants, accessible to persons with disabilities and the elderly, and energy efficient. The TAG also evaluated whether modifications were needed to ensure the provisions were correlated with other requirements, technically feasible, commercially available, and cost-effective to building owners and tenants, or if changes were necessary to mitigate any disproportionate impact on small business. 51 proposals were submitted during the two-month submittal period. After hundreds of hours of discussions, the TAG recommended approval of 50 proposals as submitted or as modified and 8 proposals were withdrawn. Most of these proposals are exempt from the cost benefit analysis requirement of RCW 34.05.328 as they are editorial or provide additional clarity to existing rules or model code language. There are also 16 significant changes to the model code with economic impact; however, the model code changes are exempt under RCW 34.05.310 (4) (c) and are not part of this report.

The local enforcement authority having jurisdiction administers the codes through the building and/or fire departments. Administrative procedures for state building code compliance are established and will not be changed by the adoption of the 2021 IFC. All businesses, including small businesses, will employ the same types of professional services for the design and construction of buildings and systems to comply with the state building code. The proposed rule updates the state building code and does not require additional equipment, supplies, labor, or other services. Services needed to comply with the building code are existing within the construction industry as required by the local authority having jurisdiction.

The proposed rule makes the IFC consistent with national standards. Businesses with new products or updated test or design standards are recognized in the updated building code. The update will result in some cost outlay for some businesses for specific building projects, for a transition period. Other businesses would see an increase in revenue. The primary intent of the amendments is to improve the safety features in buildings and provide consistency and fairness across the state, for a predictable business environment. The amendments should result in enhanced safety and value in buildings.

II. Code Proposals Identified as Significant.

1. Summary of Probable Benefits vs Probable Costs.

1.1. Section IFC 3303.5 ([21-GP1-019](#)):

This proposal adds an exception to section 3303.5 Fire safety requirements for buildings of Types IV-A, IV-B, and IV-C construction. The added exception #2 will eliminate the need for Noncombustible protection on the top surface of mass timber floor assemblies before erecting additional floor levels. Oral testimony from a fire protection engineers in support of the proposal at the Committee Action Hearings also stated that protecting the top surface of floors is not necessary, from a fire standpoint. Heat travels upward, so the floor surface does not have the same exposure as vertical surfaces or ceilings above. This proposal will decrease the cost of construction for taller mass timber buildings, by increased efficiency of construction sequencing and reduced construction time.

1.2. Section IFC 903.3.1.2 ([21-GP1-020](#)):

Undoes a change that was made to the 2021 IFC and IBC (FS117-18), returning the language in the section to the 2018 text, and aligns the code with the scoping provisions of NFPA 13R. The 2021 change unnecessarily limits the applicability of NFPA 13R systems, particularly for podium buildings, triggering a requirement for a full NFPA 13 system in more buildings. If adopted by the SBCC, the 2021 IFC/IBC requirement would decrease affordability for residential construction,



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since a full NFPA 13 system would be required in shorter buildings. The new proposal will decrease construction cost. According to a November 2020 article on the National Fire Sprinkler Association website:

- The National Multifamily Housing Council members estimate a NFPA 13 system costs “an average of \$1 to \$2 more per square foot than NFPA 13R”
- “NFPA Journal notes that installing an NFPA 13 system can cost four to six times more than an NFPA 13R system and include a four to six times greater construction turnaround time.”

1.3. Sections IFC 105 and 301.2 and new 321, 322.1 through 322.4.3.3, 403.10.6 and revision to table 903.2.11.6. Lithium batteries ([21-GP1-023](#))

There currently are no specific requirements in the IFC that regulate the storage of lithium-ion and lithium-metal batteries. Lithium-ion and lithium metal batteries can create challenging fire hazards. This proposal includes requirements that regulate the collection and storage of these batteries to reduce the probability of an event and mitigate any adverse impact on the affected facility and public safety. The requirements are intended to cover all types of lithium-ion and lithium metal batteries (e.g., new, used, waste, refurbished), used batteries being collected for recycling or disposal, and batteries at recycling and disposal facilities. The proposal has the potential to increase the costs associated with the collection and storage of these batteries. 1 hour of plan review and 1 hour of inspection time is estimated per permit application.

1.4. Chapter 80, Reference Standards ([21-GP1-035](#))

The requirement for fire sprinklers in elevator pits produces a cost of approximately \$10,000-15,000 dollars as well as maintenance of the system and associated devices. The removal of this requirement will result in a decreased construction costs for a system that has a marginal effect on the life safety improvement in the building. The cost for the shunt trip is approximately \$6,000-\$10,000. Relays are about \$350 each, and monitoring modules are about \$500 each. Including wiring, label and markup, the cost is approximately \$10,000-15,000 to install an elevator shunt trip. There is additional cost to install heat detection for operating the shunt trip at the top of shaft and elevator equipment room of around \$2,000-3,000 depending upon the building. Fire sprinkler would also need to be provided to meet NFPA 13 at a cost of \$2,000-\$5,000 depending upon the building. This is a conservative projection of the cost, and it could be more or less depending upon the particular building.

1.5. Chapter 2 Definitions, Sections: 902, 904.1.1, 904.1.1.1, 904.1.1.2, 904.1.1.3 ([21-GP1-050](#))

This proposal is an existing WA State amendment with proposed changes to align certifications for not only service personnel, but designers and installers as well. The proposed amendment utilizes nationally recognized NICET certifications for Special Hazards Suppression Systems which encompasses NFPA 11, 12, 12A, 13, 16, 17, 17A, 25, 70, 72, 68, 69, 750, & 2001. This proposed amendment also aligns with NICET certifications for Section 903 “Automatic Sprinkler Systems” and Section 907 “Fire Alarm and Detection Systems”. The exception allows



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current ICC/NAFED certification holders to continue to provide installation and service to Kitchen Fire Suppression systems which was originally the intent of this WA State Amendment. The proposal also includes a new definition for Special Hazards Suppression Systems. This code clarification would bring consistency across all jurisdictions and will result in an increased cost. Level 1 application cost: \$230.00, 140-minute exam time limit. Level 2 application cost: \$300.00, 170-minute exam time limit. Total labor to achieve level 2 = 5.2 hours Our average technician wage is \$38.00 per hour. The total would be approximately \$727.60 per employee needing certification.

1.6. Section IFC 1207.1.4 Hazard Mitigation Analysis ([21-GP1-071](#)).

This proposal adds a condition #4 to 1207.1.4. (Where flammable gases can be produced under abnormal conditions.) Recent editions and revisions to the Fire Code and NFPA 855 are adding a situation that would trigger an HMA in addition to the three currently listed. Specifically, an HMA shall be required when an ESS battery technology emits flammable gases during abnormal conditions. This provision will require system designers to carefully consider the hazards specific to lithium-ion battery technology. The economic impact will be increased due to the cost of services for the analysis and will scale with the complexity and size of the system. This mitigation analysis for lithium batteries is new and an accurate cost is impossible currently to formulate.

1.7. Sections IFC 903.2.1.3 and 4901.1, Chapter 10 (various sections) ([21-GP1-068](#)), ([21-GP1-075](#))

The code proposals are addressing fixed guideway and passenger rail systems. Proposal 21-GP1-068 is intended to correlate the IBC/IFC requirements for fire protection to NFPA 130 requirements. The primary purpose is to clarify the requirements for fire protection at open stations. IFC Chapter 9 requires fire protection in Group A3 occupancies and levels from the Group A3 occupancy to the level of exit discharge. However, for open stations, NFPA 130 only requires fire protection in areas with combustibles loading. The code and standard are in conflict, but pursuant to Chapter 1 of IFC, the code language prevails. Some jurisdictions have required fire protection at the platform level and at the plaza level while others have not. This code clarification would bring consistency across all jurisdictions and will result in significant decrease in building cost. For justification the proponent uses an estimate for elevated station in design in North Seattle, which shows a significant decrease in building costs of \$225,348. Proposal 21-GP1-075 is drawn from NFPA 130 amendments by the City of Bellevue and the City of Seattle for means of egress for light rail stations. The intent is to provide clarity for more consistent application of the IFC and NFPA 130 in the future as light rail service expands and extends into new jurisdictions. The proposal clarifies conflicts between the IFC and NFPA 130; there is no associated cost with the adoption.



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2. List of Code Proposals.

Date: 12/6/2021

Log # 21-GP1-019

Proponent and description:

John Siu, Fire safety requirements for buildings of Types IV-A, IV-B and IV-C construction

Compliance with RCW 34.05.328 Significant legislative rules, other selected rules

(1)(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements

RCW 19.27.020

Purposes—Objectives—Standards.

The purpose of this chapter is to promote the health, safety and welfare of the occupants or users of buildings and structures and the general public by the provision of building codes throughout the state. Accordingly, this chapter is designed to effectuate the following purposes, objectives, and standards:

{Check each one that applies}

(1) To require minimum performance standards and requirements for construction and construction materials, consistent with accepted standards of engineering, fire and life safety.

(2) To require standards and requirements in terms of performance and nationally accepted standards.

(3) To permit the use of modern technical methods, devices and improvements.

(4) To eliminate restrictive, obsolete, conflicting, duplicating and unnecessary regulations and requirements which could unnecessarily increase construction costs or retard the use of new materials and methods of installation or provide unwarranted preferential treatment to types or classes of materials or products or methods of construction.

(5) To provide for standards and specifications for making buildings and facilities accessible to and usable by physically disabled persons.

(6) To consolidate within each authorized enforcement jurisdiction, the administration and enforcement of building codes.

(1)(b) Determine that the rule is needed to achieve the general goals and specific objectives stated under (a) of this subsection, and analyze alternatives to rule making and the consequences of not adopting the rule:

The Council is required to adopt and maintain the state building code, as provided in chapters 19.27, 19.27A, and 70.92 RCW, and the state legislature. The primary objective of the Council is to encourage



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(1)(d) Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented;

This proposal will decrease the cost of construction for taller mass timber buildings, by increased efficiency of construction sequencing and reduced construction time. No increase in plan review time since this is about construction sequencing. Will marginally decrease the time for inspections (will not need separate inspections for each story above the 6th.)

(1)(f) Determine that the rule does not require those to whom it applies to take an action that violates requirements of another federal or state law:

The primary objective of the Council is to encourage consistency in the building code throughout the state, and to maintain the building code consistent with the state's interest. The rule does not require those to whom it applies to take an action that violates requirements of another federal or state law.

(1)(g) Determine that the rule does not impose more stringent performance requirements on private entities than on public entities unless required to do so by federal or state law:

The adoption and amendment of the 2021 IFC do not impose more stringent performance requirements on private entities than on public entities.

(1)(h) Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter and, if so, determine that the difference is justified by the following:

This does not differ any federal regulations or statute applicable to the same activity or one of the following

(1)(i) A state statute that explicitly allows the agency to differ from federal standards; or

(1)(ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated under (a) of this subsection; and

(1)(iii) Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter.



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Date: 12/6/2021

Log # [21-GP1-050](#)

Proponent and description: *Ken Brouillette, Zachary Tuck.*

Chapter 2 Definitions, Sections: 902, 904.1.1, 904.1.1.1, 904.1.1.2, 904.1.1.3 Certification of service personnel for fire-extinguishing equipment, Pre-engineered kitchen fire extinguishing systems, engineered fire suppression systems, Pre-engineered industrial fire extinguishing system

Compliance with RCW 34.05.328 Significant legislative rules, other selected rules

(1)(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements

[RCW 19.27.020](#)

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(6) To consolidate within each authorized enforcement jurisdiction, the administration and enforcement of building codes.

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The exam is administered at Pearson-vue testing centers. Most every major city has one. Depending on your location you will have travel time, parking costs, etc.

Level 1 application cost: \$230.00, 140 minute exam time limit Level 2 application cost: \$300.00, 170 minute exam time limit Total labor to achieve level 2 = 5.2 hours Our average technician wage is \$38.00 per hour Cost = \$727.60

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(1)(i) A state statute that explicitly allows the agency to differ from federal standards;
or

(1)(ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated under (a) of this subsection; and

(1)(iii) Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter.

Date: 12/6/2021

Economic Impact Statements

Log # [21-GP1-068](#), [21-GP1-075](#)

Proponent and description: *Kym Williams, Sound Transit and Mark Murray, Senior Fire Protection Engineer*

Sections: 903.2.1.3 and 4901.1 and Chapter 10. Fixed Guideway Transit and Passenger Rail Systems Stations – Fire Protection and means of egress.

Compliance with RCW 34.05.328 Significant legislative rules, other selected rules

(1)(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements

[RCW 19.27.020](#)

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(2) To require standards and requirements in terms of performance and nationally accepted standards.



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- (3) To permit the use of modern technical methods, devices and improvements.
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IFC Chapter 9 requires fire protection in Group A3 occupancies and levels from the Group A3 occupancy to the level of exit discharge. However, for open stations, NFPA 130 only requires fire protection in areas with combustible loading. The code and standard are in conflict but the IBC has language that the code prevails when there is a conflict between the code and an adopted standard. Some jurisdictions have required fire protection at the platform level and at the plaza level while others have not. This code clarification would bring consistency across all jurisdictions. NFPA 13-8.15.7.2 has language for external projections where sprinklers are not required that, even for a fully protected station per NFPA 13, could be applied and allow omission of sprinklers at the platform canopy. The IBC has exempt location language for fire protection (903.3.1.1.1) for areas that are wholly noncombustible that could apply to the open areas of the plaza (the area below an elevated platform for example). However, these code and



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standard provisions can be interpreted differently which leads to inconsistency across multiple jurisdictions. Definition Explanation: (NFPA 130) Traction Power Substations (TPSS) is added to the definition to NFPA 130 because they are identified as an area that will not be provided with fire protection in otherwise protected stations. A TPSS converts power from AC (e.g., 26kV) power to DC (1500V) power to supply the overhead catenary system (OCS) to power the light rail vehicles. There is an increased risk of electrocution in the application of water to certain electrical equipment whose primary feeders cannot be readily de-energized or are without circuit breakers. Omitting fire protection is consistent with SBC 903.1.1.1 for vaults

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Date: 12/6/2021

Economic Impact Statements

Log # [21-GP1-071](#)

Proponent and description: Scott Lang – Honeywell International



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Section 1207.1.4 Hazard Mitigation Analysis.

Compliance with RCW 34.05.328 Significant legislative rules, other selected rules

(1)(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements

[RCW 19.27.020](#)

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(1)(d) Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented;

Recent editions and revisions to the Fire Code and NFPA 855 are adding a situation that would trigger an HMA in addition to the three currently listed. Specifically, an HMA shall be required when an ESS battery technology emits flammable gases during abnormal conditions. This provision will require system designers to carefully consider the hazards specific to lithium-ion battery technology.

(1)(f) Determine that the rule does not require those to whom it applies to take an action that violates requirements of another federal or state law:

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(1)(g) Determine that the rule does not impose more stringent performance requirements on private entities than on public entities unless required to do so by federal or state law:

The adoption and amendment of the 2021 IFC do not impose more stringent performance requirements on private entities than on public entities.

(1)(h) Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter and, if so, determine that the difference is justified by the following:

This does not differ any federal regulations or statute applicable to the same activity or one of the following

(1)(i) A state statute that explicitly allows the agency to differ from federal standards;
or

(1)(ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated under (a) of this subsection; and

(1)(iii) Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter.



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Date: 12/6/2021

Economic Impact Statements

Log # [21-GP1-020](#)

Proponent and description:

Jonathan Siu, Section 903.3.1.2 NFPA 13R sprinkler systems

Compliance with RCW 34.05.328 Significant legislative rules, other selected rules

(1)(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements

[RCW 19.27.020](#)

Purposes—Objectives—Standards.

The purpose of this chapter is to promote the health, safety and welfare of the occupants or users of buildings and structures and the general public by the provision of building codes throughout the state. Accordingly, this chapter is designed to effectuate the following purposes, objectives, and standards:

{Check each one that applies}

- (1) To require minimum performance standards and requirements for construction and construction materials, consistent with accepted standards of engineering, fire and life safety.
- (2) To require standards and requirements in terms of performance and nationally accepted standards.
- (3) To permit the use of modern technical methods, devices and improvements.
- (4) To eliminate restrictive, obsolete, conflicting, duplicating and unnecessary regulations and requirements which could unnecessarily increase construction costs or retard the use of new materials and methods of installation or provide unwarranted preferential treatment to types or classes of materials or products or methods of construction.
- (5) To provide for standards and specifications for making buildings and facilities accessible to and usable by physically disabled persons.



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(6) To consolidate within each authorized enforcement jurisdiction, the administration and enforcement of building codes.

(1)(b) Determine that the rule is needed to achieve the general goals and specific objectives stated under (a) of this subsection, and analyze alternatives to rule making and the consequences of not adopting the rule:

The Council is required to adopt and maintain the state building code, as provided in chapters 19.27, 19.27A, and 70.92 RCW, and the state legislature. The primary objective of the Council is to encourage consistency in the building code throughout the state of Washington and to maintain the building code consistent with the state's interest as provided in RCW 19.27.020. The statewide code adoption process is defined in WAC 51-04 and the Council by-laws. All proposals are submitted in writing on the appropriate form with the indicated supporting documentation. Each proponent must identify where a proposed amendment has an economic impact and estimate the costs and savings of the proposal on construction practices, users and/or the public, the enforcement community, and operation and maintenance. There are no alternatives to this procedure. If the rule is not adopted, this will be a violation of the State Law, which will affect the promotion of fire and life safety in buildings consistent with accepted standards.

(1)(d) Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented;

This proposal undoes a change that was made to the 2021 IFC and IBC (FS117-18), returning the language in the section to the 2018 text, and aligns the code with the scoping provisions of NFPA 13R. The 2021 change unnecessarily limits the applicability of NFPA 13R systems, particularly for podium buildings, triggering a requirement for a full NFPA 13 system in more buildings. If adopted by the SBCC, the 2021 IFC/IBC requirement would decrease affordability for residential construction, since a full NFPA 13 system would be required in shorter buildings. During the ICC process, this proponent and a representative from the City of Seattle Fire Marshal's Office testified against this change but were ultimately unsuccessful in defeating the proposal. The proposal, along with our public comments in opposition to the change are attached for reference.

(1)(f) Determine that the rule does not require those to whom it applies to take an action that violates requirements of another federal or state law:

The primary objective of the Council is to encourage consistency in the building code throughout the state, and to maintain the building code consistent with the state's interest. The rule does not require those to whom it applies to take an action that violates requirements of another federal or state law.

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(1)(h) Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter and, if so, determine that the difference is justified by the following:

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(1)(i) A state statute that explicitly allows the agency to differ from federal standards;
or

(1)(ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated under (a) of this subsection; and

(1)(iii) Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter.

Date: 12/6/2021

Economic Impact Statements

Log # [21-GP1-020](#)

Proponent and description:

Ken Brouillette 2021 IFC Section 105 and 301.2 and new 321322.1 through 321322.4.3.3, 403.10.6 and revision to table 903.2.11.6. Lithium batteries

Compliance with RCW 34.05.328 Significant legislative rules, other selected rules

(1)(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements

[RCW 19.27.020](#)

Purposes—Objectives—Standards.

The purpose of this chapter is to promote the health, safety and welfare of the occupants or users of buildings and structures and the general public by the provision of building codes throughout the state. Accordingly, this chapter is designed to effectuate the following purposes, objectives, and standards:

{Check each one that applies}



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- (1) To require minimum performance standards and requirements for construction and construction materials, consistent with accepted standards of engineering, fire and life safety.
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- (3) To permit the use of modern technical methods, devices and improvements.
- (4) To eliminate restrictive, obsolete, conflicting, duplicating and unnecessary regulations and requirements which could unnecessarily increase construction costs or retard the use of new materials and methods of installation or provide unwarranted preferential treatment to types or classes of materials or products or methods of construction.
- (5) To provide for standards and specifications for making buildings and facilities accessible to and usable by physically disabled persons.
- (6) To consolidate within each authorized enforcement jurisdiction, the administration and enforcement of building codes.

(1)(b) Determine that the rule is needed to achieve the general goals and specific objectives stated under (a) of this subsection, and analyze alternatives to rule making and the consequences of not adopting the rule:

The Council is required to adopt and maintain the state building code, as provided in chapters 19.27, 19.27A, and 70.92 RCW, and the state legislature. The primary objective of the Council is to encourage consistency in the building code throughout the state of Washington and to maintain the building code consistent with the state's interest as provided in RCW 19.27.020. The statewide code adoption process is defined in WAC 51-04 and the Council by-laws. All proposals are submitted in writing on the appropriate form with the indicated supporting documentation. Each proponent must identify where a proposed amendment has an economic impact and estimate the costs and savings of the proposal on construction practices, users and/or the public, the enforcement community, and operation and maintenance. There are no alternatives to this procedure. If the rule is not adopted, this will be a violation of the State Law, which will affect the promotion of fire and life safety in buildings consistent with accepted standards.

(1)(d) Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented;

There currently are no specific requirements in the IFC that regulate the storage of lithium-ion and lithium-metal batteries. Lithium-ion and lithium metal batteries can create challenging fire hazards. This proposal includes requirements that regulate the collection and storage of these batteries so as to



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reduce the probability of an event and mitigate any adverse impact on the affected facility and public safety. The requirements are intended to cover all types of lithium-ion and lithium metal batteries (e.g., new, used, waste, refurbished), used batteries being collected for recycling or disposal, and batteries at recycling and disposal facilities. Details on the proposal are as follows: Section 321.1 identifies the threshold quantities of batteries that are regulated by Section 321. As noted in the exceptions, it is not the intent to cover lithium-ion and lithium metal batteries in products, devices or vehicles, in small retail packaging, or the temporary storage of batteries at manufacturing facilities or in transit. Section 321.3 requires a fire safety and evacuation plan to be provided in accordance with a new section 403.10.6 Section 321.4.1 includes requirements for limited indoor battery storage in containers. This is primarily intended to cover the containers used to collect used batteries for recycling or disposal. These types of containers can be found in many establishments, including mercantile and other occupancies. There is a limitation for an individual container to not exceed 7.5 cubic feet, which is approximately the size of a 55 gallon barrel. A maximum 15 cubic feet of storage (two 55 gallon barrels) are allowed in this code application. Indoor storage in excess of these values will be regulated in accordance with Section 321.4.2, and will require, among other things, an operational permit. Indoor storage areas other than the limited storage applications covered by 321.4.1 are required to comply with all applicable requirements in 321.4.2.1 through 321.4.2.6. Section 321.4.2.6 recognizes that lithium-ion batteries not exceeding 30% state of charge (SOC) have been shown to be less likely to undergo thermal runaway or propagate than fully charged batteries, and the 30% SOC level is recognized by the U.S. Department of Transportation (DOT) and other transport agencies (e.g., Transport Canada, International Civil Aviation Organization) as providing an additional level of safety for shipping by air. This section allows the fire code official to waive specific protection requirements based on approval of the procedures used for limiting and verifying that the state of charge will not exceed 30 percent. It is assumed that the procedures used to verify the SOC can be periodically checked as part of the operational permit on the operation. Section 321.4.3 includes requirements covering the outdoor storage of lithium-ion or lithium metal batteries It includes criteria for: 1. Location of storage in proximity to exposures 2. Storage area size limits and separation 3. Fire detection requirements. A new Section 403.10.6 is provided which includes requirements for providing a fire safety plan for battery storage. This is code change proposal F21-21 and the committee added exception 5 under 321.1 and added "new or refurbished" to exceptions 1 and 2. The committee stated that the reason for the approval of the modification that added exception 5 of Section 321.1 was that the repair process specifically is essential to this as a repair shop could have several of these batteries out of the cars at one time, and that these are relatively new batteries and they are involved in a repair process which was noted as an essential change to the proposal. The stated reason for the approval of the modification that added the "New or refurbished" language was that in the testimony it was pointed out that a refurbished battery is essentially the same thing as far as the safety components and so the intent here is not to address these in the same way that storage batteries are being addressed. The reason for the approval of the proposal with the modifications was stated that this is a very reasonable approach to look at how you can mitigate the hazard that is recognized with this type of battery chemistry with mitigation that includes detection, suppression, emergency plans, and coordination with facility owners and emergency responders.



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(1)(ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated under (a) of this subsection; and

(1)(iii) Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter.

Date: 12/6/2021

Economic Impact Statements

Log # [21-GP1-035](#)

Proponent and description:

Dave Kokot, IFC Chapter 80; IBC Chapter 35, Reference Standards

Compliance with RCW 34.05.328 Significant legislative rules, other selected rules

(1)(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements

[RCW 19.27.020](#)

Purposes—Objectives—Standards.



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(1)(d) Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented;

The requirement for fire sprinklers in pits of hydraulic elevators is predicated by the amount of debris that is collected in the pit and the potential of an ignition source that could cause a fire. With the advent of hydraulic fluids that are combustible but at flashpoints near 450 degrees F. the lack of ignition sources (cigarette use in buildings has significantly decreased), the reduction of combustible materials found in elevator pits, and the significant reduction nationally in the amount of elevator pit fires (see NFPA data attached), the need for a fire sprinkler in the pit and elevator equipment room been significantly reduced. NFPA 13 has included language in the commentary that the requirement of sprinklers in the pit needs to be evaluated for benefit compared to the additional cost to install sprinklers, additional detection, and a shunt trip to accommodate shutting off the power to the elevator before fire sprinklers are activated. This has been discussed by the City of Spokane with the State Elevator Inspector. They currently have to enforce the requirement as well as directing the two cities in the State that have elevator programs (Seattle and Spokane). Seattle has already obtained a WAC to allow them to have a manual sprinkler system for the elevator pit, and Spokane used a performance based alternative method to not require fire sprinklers in pits of hydraulic elevators. This amendment would recognize the low risk associated with elevator pit fires and the unnecessary expenditure to provide protection.

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(1)(iii) Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter.