



STATE OF WASHINGTON
STATE BUILDING CODE COUNCIL

May 2018
Log No. _____

1. State Building Code to be Amended:

- | | |
|---|---|
| <input checked="" type="checkbox"/> International Building Code | <input type="checkbox"/> International Mechanical Code |
| <input type="checkbox"/> ICC ANSI A117.1 Accessibility Code | <input type="checkbox"/> International Fuel Gas Code |
| <input type="checkbox"/> International Existing Building Code | <input type="checkbox"/> NFPA 54 National Fuel Gas Code |
| <input type="checkbox"/> International Residential Code | <input type="checkbox"/> NFPA 58 Liquefied Petroleum Gas Code |
| <input checked="" type="checkbox"/> International Fire Code | <input type="checkbox"/> Wildland Urban Interface Code |
| <input type="checkbox"/> Uniform Plumbing Code | |

For the Washington State Energy Code, please see specialized [energy code forms](#)

Section(s):

**IBC 903.2.1.3 and 3114
IFC 903.2.1.3 and 4001.1**

Title: Fixed Guideway Transit and Passenger Rail Systems Stations – Fire Protection

2. Proponent Name (Specific local government, organization or individual):

**Proponent: Kym Williams, Sound Transit
Title: Acting Director, Regulatory Permitting
Date: May 20, 2021**

3. Designated Contact Person:

**Name: Mark Murray
Title: Senior Fire Protection Engineer
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E-Mail address: mark.murray@soundtransit.org**

4. Proposed Code Amendment. Reproduce the section to be amended by underlining all added language, striking through all deleted language. Insert new sections in the appropriate place in the code in order to continue the established numbering system of the code. If more than one section is proposed for amendment or more than one page is needed for reproducing the affected section of the code additional pages may be attached. (Examples on the SBCC [website](#))

IBC 903.2.1.3 and 3114

IFC 903.2.1.3 and 4001.1

Enforceable code language must be used; see an example [by clicking here](#).

Amend section to read as follows:

IBC

903.2.1.3 Group A-3. An automatic sprinkler system shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the levels of exit discharge serving that occupancy where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Exception: For fixed guideway transit and passenger rail system stations, an automatic sprinkler system shall be provided in accordance with Section 3114.

IFC

903.2.1.3 Group A-3. An automatic sprinkler system shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the levels of exit discharge serving that occupancy where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Exception: For fixed guideway transit and passenger rail system stations, an automatic sprinkler system shall be provided in accordance with Section 4001.

3114.2 Fixed guideway and passenger rail systems. Construction of fixed guideway transit and passenger rail systems shall be in accordance with NFPA 130, standard for fixed transit and passenger rail systems, as modified below.

4001.1 Scope. Fixed guideway transit and passenger rail systems shall be in accordance with NFPA 130, as modified below.

3.3.44.2 Traction Power Sub Station (TPSS): A TPSS is an electrical substation consisting of switchgear transformers/rectifiers, emergency trip equipment, and other systems that converts AC electric power provided by the electrical power industry for public utility service to DC voltage to supply light rail vehicles with traction current.

5.4.4.1* An automatic sprinkler ~~protection~~ system shall be provided throughout enclosed stations in areas of stations used for concessions, in storage areas, in trash rooms, and other similar areas with combustible loadings, except trainways.

Exceptions:

1. Traction power substation (TPSS) when located in a transformer vault designed in accordance with the NFPA 70.
2. Other high voltage equipment located in a transformer vault designed in accordance with the NFPA 70 when approved by the Fire Code Official.
3. Fire command centers, communication room(s), and signal rooms when protected with clean agent fire suppression and separated from other spaces with 2-hour fire rated construction.
4. Other operational critical rooms when protected with clean agent fire suppression and separated from other spaces with 2-hour fire rated construction, when approved by the Fire Code Official.

5.4.4.1.1 An automatic sprinkler system shall be provided in areas of open stations used for concessions, markets, storage areas and similar areas with combustible loadings, and in trash rooms, electrical rooms, mechanical rooms, machinery rooms, communication rooms and other enclosed rooms.

Exceptions:

1. Stations at grade with less than 1,500 sf of ancillary area/ancillary space.
2. Fire command centers, communication room(s), and signal rooms when protected with clean agent fire suppression and separated from other spaces with 2-hour fire rated construction.
3. Other operational critical rooms when protected with clean agent fire suppression and separated from other spaces with 2-hour fire rated construction, when approved by the Fire Code Official.

5.4.4.2 Sprinkler protection shall be permitted to be omitted in areas of open stations ~~remotely located~~ separated from public spaces the station by a distance of 20 feet.

5.4.4.3 Where required, sprinkler systems shall be designed and installed in accordance with NFPA 13.

5.4.4.4 A sprinkler system waterflow alarm and supervisory signal service shall be installed.

5.4.4.5 Other fire suppression systems, if approved, shall be permitted to be substituted for automatic sprinkler systems in the areas listed in 5.4.4.1.

5.4.4.6 Automatic fire sprinkler shall be tested and maintained in accordance with NFPA 25.

5.4.5 Standpipe and Hose Systems.

5.4.5.1* Class I standpipes shall be installed in enclosed stations in accordance with International Fire Code Section 905. NFPA 14 except as modified herein.

5.4.6 Portable Fire Extinguishers.

Portable fire extinguishers in such number, size, type, and location in accordance with the International Fire Code Section 906 ~~as determined by the authority having jurisdiction shall be provided.~~

5.4.6.1 Portable fire extinguishers are not required in public areas of at-grade stations.

5.4.7 Ventilation.

Emergency ventilation shall be provided in enclosed stations in accordance with Chapter 7 and International Building Code Section 909.

Chapter 80 REFERENCED STANDARDS

130-20: Fixed Guideway Transit and Passenger Rail Systems

- 5. Briefly explain your proposed amendment, including the purpose, benefits and problems addressed.** Specifically note any impacts or benefits to business, and specify construction types, industries and services that would be affected. Finally, please note any potential impact on enforcement such as special reporting requirements or additional inspections required.

This code amendment 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. Other related amendments are also included.

Why is the amendment needed?

IBC 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 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 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.

Justification:

For enclosed stations the proposal aligns with the cities of Seattle and Bellevue code amendment proposals requiring full protection. Those existing amendments are logical and consistent with IBC requirements for underground buildings and buildings without windows for example. Exceptions have been added for high voltage rooms with fire separation consistent with provision for electrical service vaults (based upon IFC 903.3.1.1.3) and other rooms where clean agent protection has been approved by many jurisdictions in lieu of fire protection.

For open stations the proposal calls for fire protection where the protection adds value but not throughout as would be required for assembly occupancies per IBC/IFC 903. Open stations include stations at grade and grade separated (elevated or recessed) that meet the NFPA 130 definition for *open station*. Areas that would not require fire protection, for example at an elevated open station, would include noncombustible canopies, concourses, exit stairs, exit access stairs, exterior stairs, ramps, plaza and other open areas below the platform. All of these areas (except enclosed stairs when provided) are unenclosed. Smoke and products of combustion would readily vent to the atmosphere. Noncombustible construction is required by NFPA 130.

An exception is added for **open stations at grade** which for a typical station would not require fire protection because the IBC/IFC threshold for fire protection at grade is 300 persons. Building area for at-grade stations is generally limited to canopies over platforms and small ancillary rooms where the occupant load would not exceed 300. Because at grade stations may have a number of canopies that are not connected it could be difficult to determine building area. To simplify application of the code the area of the ancillary area/space is used rather than the area of the assembly space. An alternate approach would be to except all at-grade stations without qualification but the proposal is more restrictive.

While NFPA 130 does not clearly require fire protection in enclosed stations the IBC requires fire protection in underground building and floors without openings that are greater than 1500 sf. All tunnel stations would meet at least one if not both of these criteria.

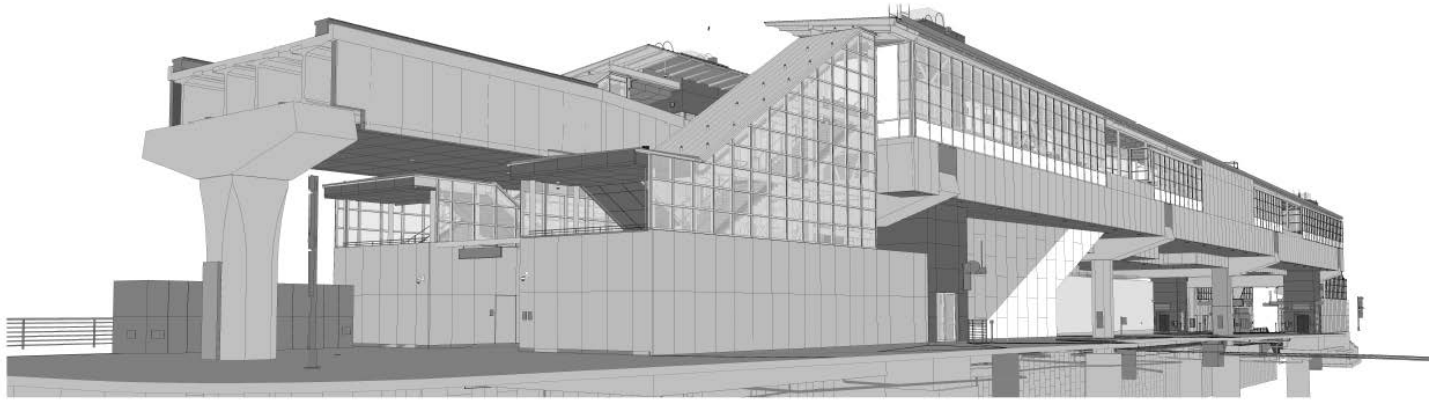
Station are required to be of noncombustible construction and open stations would vent products of combustion and are less likely to become untenable. While a group A-3 occupancy is intended to be a catch-all for assembly occupancies that do not clearly fall into the other divisions. Transit stations are unique and fire protection does not, in all cases, add significant value to open stations of noncombustible construction. See open station full perspective 3D drawings below.

Portable fire Extinguishers

An exception has been included to remove the requirement for portable fire protection from public areas of at-grade stations that cannot be secured. Fire extinguishers would still be provided where required in back of house ancillary areas. Theft and vandalism is a chronic problem as some at grade stations. The public can simply evacuate the station in the event of an incipient fire.

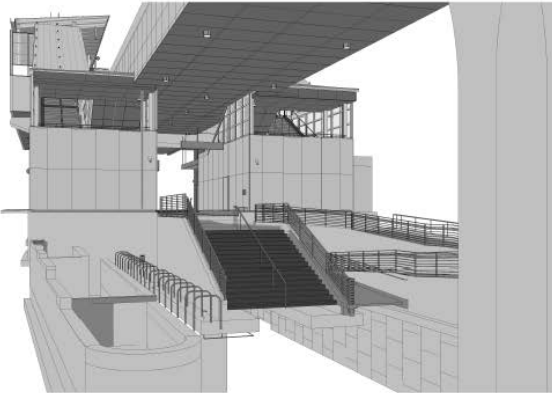
Ventilation

An amendment has been made where the code refers to Section 7 of NFPA 130 which includes provision for smoke control. The IBC section 909 also has requirement for smoke control that may go beyond the requirements of NFPA 130. This reference clarifies IBC 909 also applies.



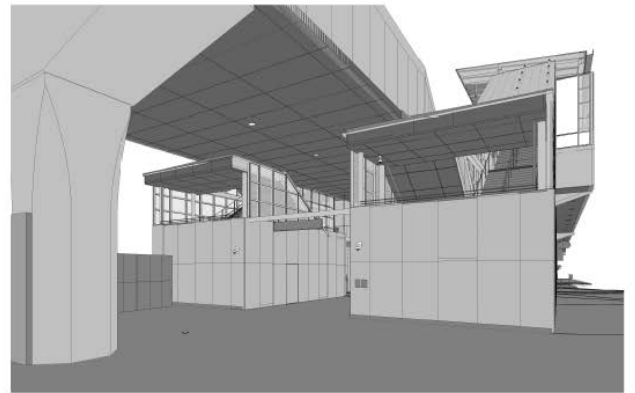
SOUTHEAST CORNER
SCALE: NTS

1
N13-AZV002



NORTH PLAZA
SCALE: NTS

2
N13-AZV002



SOUTH PLAZA
SCALE: NTS

3
N13-AZV002

Figure 1- Elevated Open Stations Example (130th Street Station North Seattle)

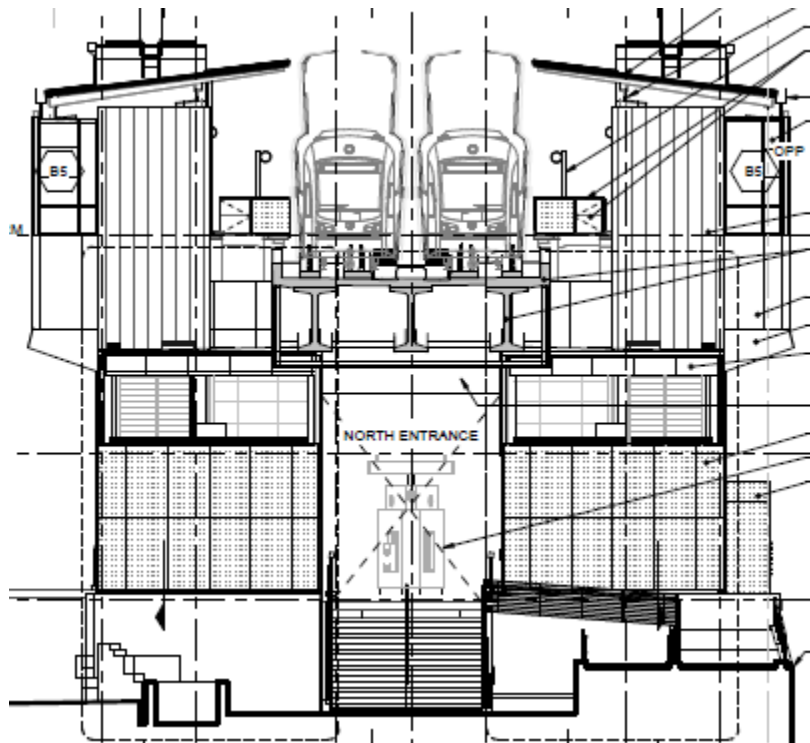


Figure 2 - Section View of 130th Street Station

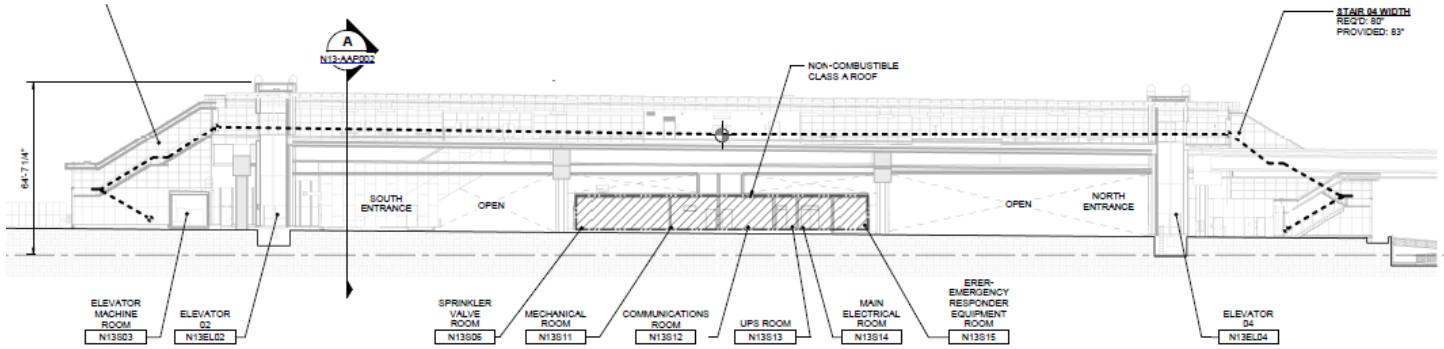


Figure 3- Elevation view with ancillary rooms shown

6. Specify what criteria this proposal meets. You may select more than one.

- The amendment is needed to address a critical life/safety need.
- The amendment clarifies the intent or application of the code.
- The amendment is needed to address a specific state policy or statute.
- The amendment is needed for consistency with state or federal regulations.
- The amendment is needed to address a unique character of the state.
- The amendment corrects errors and omissions.

7. Is there an economic impact: Yes No

Explain: This amendment is to clarify code conflicts between the IBC and NFPA 130.

If there is an economic impact, use the tool below to estimate the costs and savings of the proposal on construction practices, users and/or the public, the enforcement community, and operation and maintenance. If preferred, you may submit an alternate cost benefit analysis.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost [Analysis tool](#) and [Instructions](#); use these [Inputs](#). [Webinars on the tool can be found Here and Here](#))

Show calculations here, and list sources for costs/savings, or attach backup data pages

The following estimate is based upon an elevated station in design in North Seattle

Cost:

\$5/square foot for fire protection of the canopy and open plaza level, and exits.

Soft costs (design, permit, sales tax, project management, etc.): Factor 1.85

Station Area:

Canopy over platform/exits	11,962
Open Plaza Level	12,400
Total area:	24,362
Cost Savings:	\$225,348

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

There would be a marginal reduction in the time for plan review and inspection because the station would still be provided with fire protection but it would be a partial system. However, this proposal should reduce time for plans examination by clarifying application of the code and eliminating the need to formal code modification or other local agreements.

Please send your completed proposal to: sbcc@des.wa.gov

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.