

**City of Seattle Amendments to
National Fire Protection Association (NFPA) 502
Standard for Road Tunnels, Bridges, and other
Limited Access Highways, 2004 edition.**

Point of Information

To purchase a copy of the NFPA 502, 2004 edition, go to www.nfpa.org or contact your nearest technical book retailer. Be sure to obtain the 2004 edition of NFPA 502 as newer editions may exist.

City of Seattle Ordinance 122491 adopts the 2006 Seattle Fire Code and by reference adopts the National Fire Protection Association (NFPA) 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition.

Sections of NFPA 502 that were amended or repealed are indicated in the excerpts shown below from below from City of Seattle Ordinance 122491. Text that is deleted from the NFPA 502 is shown with strikethrough and enclosed in double parenthesis. Text that was added as a Seattle amendment is shown as underlined. Where an entire section was deleted, it is noted as being repealed. Three asterisks indicate that the subsection continues unchanged from the NFPA language.

Subsection 4.2 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

4.2 Safeguards During Construction. During the course of construction or alteration of any facility addressed in this standard, the provisions of ~~((NFPA 241))~~ Chapter 14 of the 2006 Seattle Fire Code and Chapter 33 of the 2006 Seattle Building Code shall apply, except as modified herein.

Subsection 4.3.3 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

4.3.3 Bridges and Elevated Highways.

~~((4.3.3.1* Critical structural members shall be protected from collision and high temperature exposure that can result in dangerous weakening or complete collapse of the bridge or elevated highway.))~~

4.3.3.1((2)) Fire protection for bridges and elevated highways shall comply with the requirements of Chapter 6 and Chapter 9.

Subsection 4.3.4.2 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is hereby repealed.

Subsection 4.3.6* of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

4.3.6* Roadway Beneath Air-Right Structures.

~~((4.3.6.1 The limits that an air-right structure imposes on the emergency accessibility and function of the roadway that is located beneath the structure shall be assessed.~~

~~4.3.6.2 Where an air-right structure encloses both sides of a roadway, it shall be considered a road tunnel for fire protection purposes and shall comply with the requirements of Chapter 7.~~

~~4.3.6.3 Where an air-right structure does not fully enclose the roadway on both sides, the decision to consider it as a road tunnel shall be made by the authority having jurisdiction after an engineering analysis in accordance with 4.3.1.~~

4.3.6.1((4)) Fire protection for roadways that are located beneath air-right structures shall comply with the requirements of Chapter 8 and Chapter 9.

A new subsection 4.7 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows

4.3.7* Ancillary Facilities. All related ancillary facilities that support the operation of limited access highways shall be protected as required by all applicable NFPA standards and local building codes, except as modified by this standard.

A new subsection 4.4 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

4.4 Emergency Response Plan.

4.4.1 A designated authority shall carry out a complete and coordinated program of fire protection that shall include written preplanned emergency response procedures and standard operating procedures.

4.4.2 Emergency traffic-control procedures shall be established to regulate traffic during an emergency.

4.4.3 Emergency procedures and the development of an emergency response plan shall be completed in accordance with the requirements of Chapter 12.

Amendments continued next page.

A new subsection 4.5 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

4.5 Emergency Communications. Emergency communications, where required by the authority having jurisdiction, shall be provided by the installation of outdoor-type telephone boxes, coded alarm telegraph stations, radio transmitters, or other approved devices. Such devices shall meet the following requirements:

- (1) They shall be made conspicuous by means of indicating lights or other approved markers.
- (2) They shall be identified by a readily visible number plate or other approved device.
- (3) They shall be posted with instructions for use by motorists.
- (4) They shall be located in approved locations so that motorists can park vehicles clear of the travel lanes.
- (5) Emergency communication devices shall be protected from physical damage from vehicle impact.
- (6) Emergency communication devices shall be connected to a staffed or monitored facility.

A new subsection 4.6 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows

4.6 Signage. Signs, mile markers, or other approved location reference markers shall be installed along the highway to allow motorists to provide authorities with accurate locations for accident or emergency areas.

Subsections 5.2 and 5.3 respectively of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, are hereby repealed.

Subsection 5.4 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

5.2((4*)) Fire Apparatus.

- 5. 2((4)).1** Arrangements for the response of nearby fire companies and emergency squads shall be made a part of the emergency response planning process.
- 5. 2((4)).2** Where a means of access that allows outside aid companies to enter the facility is provided, procedures for using such access shall be included in the emergency response plan.
- 5. 2((4)).3** Precautions shall be taken at the points of entry to alert and control traffic to allow emergency equipment to enter safely

Subsection 5.5 and 5.6 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, are hereby repealed.

Subsections 6.2 and 6.3 respectively of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, are amended as follows:

Point of Information

Where numbers and titles of subsections are retained and the body of text in the subsection is struck, the numbers and titles have no meaning for purpose of enforcement.

6.2 Emergency Communications. (~~Emergency communications, where required by the authority having jurisdiction, shall be provided by the installation of outdoor type telephone boxes, coded alarm telegraph stations, radio transmitters, or other approved devices. Such devices shall meet the following requirements:~~

- ~~(1) They shall be made conspicuous by means of indicating lights or other approved markers.~~
- ~~(2) They shall be identified by a readily visible number plate or other approved device.~~
- ~~(3) They shall be posted with instructions for use by motorists.~~
- ~~(4) They shall be located in approved locations so that motorists can park vehicles clear of the travel lanes.)~~

6.3 Signage. (~~Signs, mile markers, or other approved location reference markers shall be installed along the highway to allow motorists to provide authorities with accurate locations for accident or emergency areas.)~~)

Subsection 6.5 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

6.5* Fire ((Standpipe))Hydrant and Water Supply. Where the distance from an acceptable water supply source as defined in 9.2.3 to any point on the bridge or elevated highway exceeds 120 m (400 ft), the bridge shall be provided with a ~~((standpipe))~~ hydrant system in accordance with the requirements of Chapter 9.

Subsection 6.7 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is hereby repealed.

Subsection 6.8 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

6.7((8)) Control of Hazardous Materials. Where required by the authority having jurisdiction, control of hazardous materials shall be in accordance with the requirements of Chapter 13.

A new subsection 6.8 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

6.8 Protection of Structure

6.8.1* Critical structural members shall be protected from collision and high-temperature exposure that can result in dangerous weakening or complete collapse of the bridge or elevated highway.

Subsection 6.9 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is hereby repealed.

Subsection 7.4.1.1 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

7.4.1.1 Manual (~~(Double-Action)~~) Fire Alarm Boxes.

* * *

Subsection 7.8 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

7.8 Standpipe, Fire Hydrant and Water Supply. Standpipe, fire hydrant and water supply systems in road tunnels shall be provided in accordance (~~(empty)~~) with the requirements of Chapter 9.

Subsections 7.13 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

7.13* Ancillary Facilities. (~~(All related ancillary facilities that support the operation of road tunnels shall be protected as required by all applicable NFPA standards and local building codes and are not covered under this standard.)~~)

Subsections 7.16 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

7.16 Emergency Response Plan.

~~(7.16.1 A designated authority shall carry out a complete and coordinated program of fire protection that shall include written preplanned emergency response procedures and standard operating procedures.~~

~~7.16.2 Emergency response procedures and the development of an emergency response plan shall comply with the requirements of Chapter 12.)~~

Subsection 7.17 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

7.17 (~~(Emergency)~~) Means of Egress.

7.17.1 General. (~~(Emergency)~~) The means of egress requirements for all road tunnels and those roadways beneath air-right structures that the authority having jurisdiction determines are similar to a road tunnel shall be in accordance with Chapter 10 of the 2006 *Seattle Building Code*, except as modified herein(~~(7.17.2 through 7.17.7)~~).

7.17.2 Tenable Environment. (~~(Identification)~~) A tenable environment shall be provided in those portions of the tunnel that are not involved in an emergency and in all emergency exits and cross passageways. (~~(Emergency exits and cross passageways shall be marked in accordance with Section 7.10 of NFPA 101.)~~)

7.17.2.1 Maintenance. The means of egress shall be maintained in accordance with Chapter 10 of the 2006 *Seattle Fire Code*.

7.17.3 Walking Surfaces.

7.17.3.1 The walking surfaces of the emergency exits, cross passageways, and walkways shall be slip resistant.

7.17.3.2 Changes in elevation, ramps, and stairs shall meet the requirements of Chapter 7 of NFPA 101.

~~((7.17.3.3* **Tenable Environment.** A tenable environment shall be provided in those portions of the tunnel that are not involved in an emergency and in all emergency exits and cross passageways.))~~

7.17.4 Doors.

7.17.4.1 Doors to the emergency exits shall open in the direction of exit travel.

7.17.4.2 Horizontal sliding doors ~~((Doors to cross passageways))~~ shall be permitted ~~((to open in either direction))~~ in cross passages.

7.17.4.3 Doors shall be listed fire doors with a minimum 1½ -hour rating and shall be installed in accordance with NFPA 80.

~~((7.17.4.4 Doors shall be equipped with hardware in accordance with NFPA 101.))~~

7.17.4.4~~((5))~~ The force required to open the doors fully when applied to the latch side shall be as low as possible, but shall not exceed 222 N (50 lb).

7.17.4.5~~((6))~~ Doors and hardware shall be designed to withstand positive and negative pressures created by passing vehicles.

7.17.5 Maintenance. ~~((Emergency exits, cross passageways, and walkways shall be maintained to allow for their intended use.))~~

7.17.6 Emergency Exits

7.17.6.1 Emergency exits shall be provided throughout the tunnel spaced not more than 300 m (1000 ft) apart.

~~((7.17.6.2* Emergency exits shall conform to NFPA 101, Chapter 7.))~~

7.17.6.2~~((3))~~**2** The emergency exits shall be enclosed in a minimum 2-hour fire-rated enclosure having a Class A interior finish as defined in NFPA 101.

7.17.7 Cross Passageways. Where tunnels are divided by a minimum of 2-hour fire-rated construction or where tunnels are in twin bores, cross passageways between the tunnels shall be permitted to be utilized in lieu of emergency exits. The following requirements shall be met:

(1) Cross passageways shall not be farther than 200 m (656 ft) apart.

~~((2) Openings in cross passageways shall be protected with self-closing fire door assemblies having a minimum of a 1-hour rating and shall be installed in accordance with NFPA 80.))~~

~~((3))~~**2** An emergency egress walkway with a minimum clear width of 1 m (3.6 ft) shall be provided on each side of the cross passageways.

(a) Walkways shall be protected from oncoming traffic by either a curb or a change in elevation or barrier.

(b) Walkways shall be continuous the entire length of the tunnel, terminating at surface grade.

(c) Raised walkways in tunnels shall have guards in accordance with 7.2.2.4 of NFPA 101.

(d) Intermediate rails shall not be required for walkway guards.

~~((4))~~**3** Where portals of the tunnel are below surface grade, surface grade shall be made accessible by a stair, vehicle ramp, or pedestrian ramp.

Subsection 8.2 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

8.2 Application. ~~((Where required by the authority having jurisdiction, the requirements of Chapter 4 shall apply.))~~

8.2.1 The limits that an air-right structure imposes on the emergency accessibility and function of the roadway that is located beneath the structure shall be assessed.

8.2.2 Where an air-right structure encloses both sides of a roadway, it shall be considered a road tunnel for fire protection purposes and shall comply with the requirements of Chapter 7.

8.2.3 Where an air-right structure does not fully enclose the roadway on both sides, the decision to consider it a road tunnel shall be made by the authority having jurisdiction after an engineering analysis in accordance with 4.3.1.

A new subsection 8.9 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

8.9 Standpipe, Fire Hydrant and Water Supply: Where the roadway beneath air-right structure length is 90m (300 ft) or greater, fire hydrants, standpipes and water supply systems shall be provided in accordance with the requirements Chapter 9.

Subsection 9.1.1 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

9.1.1 Standpipe systems for ~~((road tunnels, bridges, depressed highways, elevated highways, roadways beneath air-right structures, and limited access highways-))~~ shall be designed, and installed~~((, inspected, and maintained))~~ as Class I systems in accordance with NFPA 14, except as modified herein.

9.1.1.1. Standpipe systems shall be inspected and maintained in accordance with NFPA 25.

Subsection 9.1.2 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

9.1.2 The required flow rate for the standpipe system shall ~~((not))~~ ~~be~~ ~~((required to exceed 1920 L/min (500 gpm)))~~ in accordance with NFPA 14, unless approved by the authority having jurisdiction.

Subsection 9.1.3 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is hereby repealed, and a new subsection 9.1.3 is adopted to read as follows:

9.1.3 Dry standpipe systems shall be installed in a manner so that the water is delivered to all hose connections on the system in 10 minutes or less.

Subsections 9.1.4 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is hereby repealed, and a new subsection 9.1.4 is adopted to read as follows:

9.1.4 Combination air relief/vacuum valves shall be installed at each high point on the system.

Subsections 9.1.5, 9.1.6, 9.1.7, 9.1.8, 9.1.9 and 9.1.10 respectively of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, are hereby repealed.

Subsection 9.2 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

9.2 Water Supply.

~~((9.2.1 Wet standpipe systems (automatic or semiautomatic) shall be connected to an approved water supply that is capable of supplying the system demand for a minimum of 1 hour.~~

~~9.2.2 Dry standpipe systems shall have an approved water supply that is capable of supplying the system demand for a minimum of 1 hour.~~

~~9.2.3 Acceptable water supplies shall include the following:~~

~~(1) Municipal or privately owned waterworks systems that have adequate pressure and flow rate and a level of integrity acceptable to the authority having jurisdiction~~

~~(2) Automatic or manually controlled fire pumps that are connected to an approved water source~~

~~(3) Pressure type or gravity type storage tanks that are installed, inspected, and maintained in accordance with NFPA 22))~~

Subsection 9.3 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, are amended as follows:

9.3 Fire Department Connections.

~~9.3.1 Fire department connections shall be of the threaded two-way or three-way 65-mm (2½-in.) four-way type or shall consist of one 100 mm (4 in.) quick-connect coupling that is accessible to a fire department pumper.~~

9.3.2 Each independent standpipe system shall have a minimum of two fire department connections that are remotely located from each other.

9.3.3 Fire department connections shall be protected from vehicular damage by means of bollards or other approved barriers.

9.3.4 ~~((Wherever possible, f))~~ Fire department connection locations shall be coordinated with emergency access and response locations.

Subsection 9.4 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

9.4 Hose Connections.

9.4.1 Hose connections shall be spaced so that no location on the protected roadway is more than 45 m (150 ft) from the hose connection.

~~9.4.2 ((Hose connection spacing shall not exceed 85 m (275 ft.))~~ Two 65 mm (2 1/2 in.) hose connection outlets shall be provided at each required hose connection location.

9.4.3 Hose connections shall be located so that they are conspicuous and convenient but still reasonably protected from damage by errant vehicles or vandals.

9.4.4 Hose connections shall have 65 mm (2½ in.) external threads in accordance with NFPA 1963 ~~((and the authority having jurisdiction))~~.

9.4.5 Hose connections shall be equipped with caps to protect hose threads.

Subsection 9.5 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is hereby repealed.

Subsection 9.6 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

9.5((6)) Identification Signs.

9.5((6)).1 Identification signage for standpipe systems and components shall be approved by and developed with input from the authority having jurisdiction.

9.5((6)).2 Identification signage shall, as a minimum, identify the name and limits of the roadway that is served.

9.5((6)).3 Identification signage shall be conspicuous and shall be affixed to, or immediately adjacent to, fire department connections and each roadway hose connection.

A new subsection 9.6 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

9.6 Fire Hydrants and Water Supply.

9.6.1 Fire hydrants for limited access highways shall be provided in accordance with Appendix C. See Table C105.1 Note c.

9.6.2 Fire hydrants for road tunnels, depressed highways, roadways beneath air-right structures, bridges, and elevated highways shall be provided so that no location on the protected roadway is more than 90 m (300 ft.) from the fire hydrant.

9.6.3 Fire hydrants shall provide a minimum of 3780 L/min (1000 gpm) at 1.4 bar (20 psi) flowing independently, and a minimum of 5760 L/min (1500 gpm) to any two outlets flowing simultaneously.

A new subsection 9.7 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

9.7 Bridges and Elevated Highways.

9.7.1 Fire hydrants for bridges and elevated highways shall be provided in accordance with this section and Section 9.2.

9.7.2 Where median dividers and/or four or more traffic lanes are present, fire hydrants for bridges and elevated highways shall be provided on both sides of the roadway at the required spacing or installed in the median divider at the required spacing.

9.7.3 Fire hydrants for bridges and elevated highways shall have two 100 mm (4 in.) hose connection outlets, with external threads in accordance with City of Seattle Standard Plan No. 310a, and each outlet provided with an indicating valve easily operable from the roadway.

9.7.4 The hose connection outlets shall be oriented parallel to the roadway and face in both directions of travel.

9.7.5 Hose connection outlets shall be positioned such that the centerline of each outlet is installed not more than 400 mm (16 in.) horizontally from the inside edge of the top and not less than 200 mm (8 in.) above the top of the guardrail or edge barrier, and not more than 1370 mm (54 in.) above the roadway.

Exception: When outlets are installed in median dividers that are more than 800 mm (32 in.) wide, the 400 mm (16 in.) from the inside edge requirement may be exceeded.

9.3.6 Hose connection outlets shall be provided with caps that are removable with a standard hydrant wrench.

9.7.7 Hose connection outlet caps shall be provided with a 3 mm (1/8 in.) hole and be secured with a short length of chain or cable to prevent falling after removal.

9.7.8 Water shall be supplied to bridge and elevated highway hydrants by the use of approved manually actuated preaction or deluge valves installed in locations not subject to freezing, such as in underground vaults or other approved locations.

9.7.9 Access to the preaction or deluge valves and manual actuation capability at the valve locations shall be provided.

9.7.10 A preaction or deluge valve actuation device (such as an electrical switch, push button, manual pull station, etc.) shall be installed at each hydrant location and be protected from damage in a weatherproof enclosure that can be opened without the use of tools or special knowledge, or with a standard hydrant wrench, or other approved method.

9.7.11 The location of the preaction or deluge valve actuation switch installed at each hydrant shall be readily visible and have appropriate signage.

9.7.12 A means to indicate that the system is in the tripped condition such as a light beacon or remote monitoring of the system shall be provided.

9.7.13 Hydrant systems for bridges and elevated highways shall have provisions for complete draining after use.

9.7.14 Combination air relief/vacuum valves shall be installed at each high point on the system.

A new subsection 9.8 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

9.8 Maintenance and Confidence Testing

9.8.1 Standpipe systems shall be inspected and tested in accordance with NFPA 25.

9.8.2 Reports of inspections and tests shall be submitted to the Seattle Fire Department Confidence Testing Unit. Maintenance and periodic testing are the owner's responsibility, or the responsibility of such other person as may be designated, and are separate from fire department inspections.

9.8.3 The person, firm or corporation performing such work shall have an appropriate certificate from the fire department. See Administrative Rules 9.01.07 *Certification for Installing, Maintaining and Testing Life Safety Systems and Equipment* and Administrative Rule 9.02.07 *Confidence Test Requirements for Life Safety Systems*.

Subsection 11.4 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

11.4*Emergency Power. ~~((Source. The power source for all systems shall be of a capacity and configuration commensurate with the purpose of the system.))~~ Road tunnels shall be provided with Class I, Type 60 emergency power in accordance with Article 700 of NFPA 70, National Electrical Code®, and NFPA 110, Standard for Emergency and Standby Power Systems. The following systems shall be connected to the emergency power system: ~~provided with reliable power for a fire emergency.))~~

(1) Emergency ~~((L))~~lighting

(2) ~~((Lighting for means of egress and areas of refuge.))~~Traffic control

(3) Exit signs

(4) Communications

- (5) Tunnel drainage ~~((and fire pump(s)))~~
- (6) Ventilation ~~((during a fire emergency))~~
- (7) Fire detection

11.4.1 The emergency power system shall have a capacity and rating sufficient to supply all equipment required to be connected by 11.4.

11.4.3 Selective load pickup and load shedding shall be permitted in accordance with NFPA 70, *National Electrical Code*®.

11.4.4~~(1)~~ The primary and secondary sources shall be wired to system equipment so that a single event or fire produces a minimum effect on the operation of the overall system.

Subsection 12.3 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

12.3* Emergency Response Plan. The emergency response plan shall be submitted for acceptance and approval by the authority having jurisdiction and shall include, as a minimum, the following:

- (1) Name of plan
- (2) Name of responsible agency
- (3) Names of responsible individuals
- (4) Dates adopted, reviewed, and revised
- (5) Policy, purpose, scope, and definitions
- (6) Participating agencies, senior officials, and signatures of executives authorized to sign for each agency
- (7) Safety during emergency operations
- (8) Purpose and operation of ~~((central supervising station))~~operations control center and alternate location(s), as applicable ~~((central supervising station))~~
- (9) Purpose and operation of command post and auxiliary command post
- (10) Communications (e.g., radio, telephone, and messenger service) available at ~~((central supervising station))~~operations control center and command post; efficient operation of these facilities
- (11) Fire detection, fire protection, and fire-extinguishing equipment; access/egress and ventilation facilities available; details of the type, amount, location, and method of ventilation
- (12) Procedures for fire emergencies, including a list of the various types of fire emergencies, the agency in command, and the procedures to follow
- (13) Maps and plans of the roadway system, including all local streets
- (14) Any additional information that the participating agencies want to include

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Subsection 12.5 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

12.5 Operations Control Center (OCC)~~((Central Supervising Station (CSS)))~~. Subsections 12.5.1 through 12.5.8 shall apply where the facility has ~~((a central supervising station))~~an operations control center for the operation and supervision of the facility.

12.5.1 The ~~((CSS))~~OCC shall be staffed by qualified, trained personnel and shall be provided with the essential apparatus and equipment to communicate with, supervise, and coordinate all personnel.

12.5.2 The ~~((CSS))~~OCC shall provide the capability to communicate rapidly with participating agencies.

12.5.5 ~~((CSS))~~OCC personnel shall be thoroughly familiar with the emergency procedure plan and shall be trained to implement it effectively.

12.5.6 An alternate site(s) that can function efficiently during an emergency in the event that the ~~((CSS))~~OCC is out of service shall be selected and equipped, or equipment shall be readily available.

12.5.7* The ~~((CSS))~~OCC shall be located in an area that is separated from other occupancies by construction that has a 2-hour fire resistance rating.

12.5.8 The ~~((CSS))~~OCC shall be protected by fire detection, fire protection, and fire-extinguishing equipment to provide early detection and suppression of fire in the OCC~~((CSS))~~.

Subsections 12.7.2, 12.7.3, 12.7.4, 12.7.5* of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, are hereby repealed.

Subsections 12.8, 12.8.1, 12.8.2 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, are hereby repealed.

Subsection 13.1 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

13.1 General. This chapter applies to the transportation of hazardous materials through road tunnels as follows:

(1) Where tunnel length equals or exceeds 240 m (800 ft) and where the maximum distance from any point within the tunnel to an area of safety exceeds 120 m (400 ft).

(2) Where tunnel length equals or exceeds 300 m (1000 ft).

This chapter does not apply to:

(1) The existing Mount Baker Tunnel (Interstate-90) and the Washington State Convention and Trade Center lid (Interstate-5) during those periods when the foam-water fire protection system(s) are fully functional and in-service.

(2) Fuel contained in the fuel system of the transporting vehicle, or in the fuel systems of vehicles and equipment being towed or carried.

13.1.1 ~~((The facility operating agency shall adopt rules and regulations that apply to the transportation of hazardous materials.))~~ Flames used for heating vehicles or loads shall be extinguished before the vehicle enters the road tunnel or its approaches.

13.1.2 ~~((A program shall be maintained for enforcing such regulations.))~~ The following classes of hazardous materials defined by the U.S. Department of Transportation, whether in tank vehicles or containers, are prohibited from being transported through road tunnels:

(1) Class 1 explosives, division 1.1, 1.2, and 1.3;

(2) Class 2, division 2.3 poisonous gas;

(3) Class 4, division 4.3 dangerous when wet materials((;))

(4) Class 6, division 6.1 poisonous materials marked PG I (Inhalation Hazard), or PG III (Stow Away From Foodstuffs),

13.1.3 ((In developing such regulations, the following shall be addressed:

- (1) Availability of a suitable alternative route(s) that meets federal requirements as prescribed in Department of Transportation, Title 49, *Code of Federal Regulations*, Part 177.825, “Routing and Training Requirements for Class 7 (Radioactive) Materials,” and Department of Transportation, Title 49, *Code of Federal Regulations*, Part 397, Subpart C, “Routing of Non-Radioactive Hazardous Materials”
- (2) Department of Transportation, Title 49, *Code of Federal Regulations*, Subtitle B, Parts 100 to 199
- (3) Fire and accident experience of facilities similar to the facility for which rules and regulations are being adopted
- (4) Previous fire and accident experience on the facility in question and adjacent roads; or, in the case of a new facility, previous fire and accident experience on roads in the area
- (5) Anticipated traffic volumes in peak and off peak periods
- (6) Need for inspection of vehicles and cargo and the availability of an approved place to conduct inspections with a minimum of traffic interference
- (7) Need and desirability of escort service with due consideration of the extent to which it could disrupt the orderly flow of traffic and create additional hazards
- (8) Plan developed by an operating agency in a dense urban area, as referenced in *Hazardous Material Transportation Regulations at Tunnel and Bridge Facilities*. The suitability of such a plan for a given facility shall also be considered.))

Tank vehicles which are empty, or which have a residue, or vehicles transporting empty containers are prohibited from entering road tunnels if they previously transported a prohibited hazardous material as set forth in 49 CFR, with the following exceptions:

- (1) Tank vehicles or containers that have been sufficiently cleaned of residue and purged of vapor to remove any potential hazard;
- (2) Tank vehicles or containers that have been reloaded with a material not classified as a hazardous material;

13.1.4 Tank vehicles used to transport the following hazardous materials, even if empty, are prohibited from entering road tunnels.

- Class 3 flammable or combustible liquids
- Oxygen (Class 2, division 2.2)
- LPG (Class 2, division 2.1)

13.1.5 Vehicles transporting hazardous materials are restricted in road tunnels in accordance with the following:

- (1) Class 2, Division 2.1 flammable gas quantities shall not exceed an aggregate of 120 gallons per vehicle and individual container capacities shall not exceed 6 gallons except for LPG. LPG quantities shall not exceed an aggregate of 120 pounds LPG capacity per vehicle and individual LPG containers shall not exceed 60 pounds LPG capacity, (141 pounds water capacity);
- (2) Class 3, flammable liquid, having a flash point below 100° F quantities shall not exceed an aggregate of 120 gallons per vehicle and individual container capacities shall not exceed 6 gallons;
- (3) Class 3, combustible liquid, formaldehyde solutions shall have individual container capacities not exceeding 100 gallons;
- (4) Class 4, division 4.1 flammable solid aggregate quantities shall not exceed 900 pounds per vehicle;

- (5) Class 4, division 4.2 spontaneously combustible material aggregate quantities shall not exceed 900 pounds per vehicle;
- (6) Class 5, division 5.1 oxidizers, transported in containers shall not exceed an aggregate quantity of 120 gallons or 900 pounds per vehicle and individual container capacities shall not exceed 6 gallons;
- (7) Class 5, division 5.2 organic peroxides, transported in containers shall not exceed an aggregate quantity of 120 gallons or 900 pounds per vehicle and individual container capacities shall not exceed 6 gallons;
- (8) Class 7, radioactive materials, transported in containers shall not exceed an aggregate quantity of 300 curies and the gross weight shall not exceed 500 pounds per vehicle and permission shall be obtained from the AHJ prior to entering a road tunnel;
- (9) Class 8, corrosive materials, transported in containers shall not exceed an aggregate quantity of 120 gallons or 900 pounds per vehicle and individual container capacities shall not exceed 60 gallons;
- (10) Class 9, miscellaneous hazardous materials, except oils, N.O.S., with a flash-point not less than 93°C/200°F transported in containers shall not exceed an aggregate quantity of 250 gallons or 2000 pounds per vehicle and individual container capacities shall not exceed 60 gallons containers.

13.1.6 Alternative-fuel vehicles powered by liquefied petroleum gas (LPG), liquefied natural gas (LNG) or compressed natural gas (CNG) shall be permitted if the:

- (1) Vehicle has a dedicated alternative-fuel system installed by the manufacturer of the vehicle
- (2) Vehicle has a fuel system which has been properly converted to an alternative fuel system.
- (3) Vehicle alternative-fuel system conforms to applicable industry standards, including:
 - (a) NFPA 52 - Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems, which is incorporated by reference; or
 - (b) NFPA 58 - Standard for the Storage and Handling of Liquefied Petroleum Gases (LPG), which is incorporated by reference.
- (4) Vehicle alternative-fuel system conforms to applicable federal regulations.
- (5) Fuel capacity of the vehicle does not exceed 300 pounds water capacity.

13.1.6.1 Alternative-fuel vehicles shall display all markings and symbols required by law to identify the alternative-fuel system.

Annex A.10.1 of National Fire Protection Association 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is amended as follows:

A.10.1 Tunnel ventilation systems that are installed in road tunnels are an important element of tunnel fire protection systems. Ventilation systems are installed in road tunnels to maintain an acceptable level of traffic-generated pollutants within the tunnel roadway.

Ventilation systems that are designed to control the contaminant levels within road tunnels (normal operations) can be configured several ways, employing either central fans or local fans.

A.10.1.1 For guidance on developing an appropriate engineering analysis, the user should reference the performance-based alternatives in NFPA 101.

Table A.10.1

<u>Cause of Fire</u>	<u>Peak Fire Heat-Release Rate</u>
	<u>MW</u>
<u>Passenger Car</u>	<u>5 – 10</u>
<u>Multiple Passenger Cars (2 – 4 vehicles)</u>	<u>10 – 20</u>
<u>Bus</u>	<u>20 – 30</u>
<u>Heavy Goods Vehicle</u>	<u>70 – 200</u>
<u>Tanker</u>	<u>200 – 300</u>

A new subsection A.13.1 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

A.13.1 Hazardous Material. A substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation for the United States Department of Transportation (U.S.D.O.T.) to be capable of posing an unreasonable risk to health, safety and property when transported in commerce and which has been so designated.

Section 424. A new TABLE A.13.1.2 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

TABLE A.13.1.2

The following classes of hazardous materials are defined in the United States Department of Transportation Regulations, 49 CFR 173, which is incorporated by reference:

<u>Name of Class or Division</u>	<u>Class Number</u>	<u>Division Number (if any)</u>	<u>49 CFR Reference for Definitions</u>
<u>Explosives (with a mass explosion hazard)</u>	<u>1</u>	<u>1.1</u>	<u>173.50</u>
<u>Explosives (with a projection hazard)</u>	<u>1</u>	<u>1.2</u>	<u>173.50</u>
<u>Explosives (with predominantly a fire hazard)</u>	<u>1</u>	<u>1.3</u>	<u>173.50</u>
<u>Explosives (with no significant blast hazard)</u>	<u>1</u>	<u>1.4</u>	<u>173.50</u>
<u>Very insensitive explosives; blasting agents</u>	<u>1</u>	<u>1.5</u>	<u>173.50</u>
<u>Extremely insensitive detonating substances</u>	<u>1</u>	<u>1.6</u>	<u>173.50</u>
<u>Flammable gas</u>	<u>2</u>	<u>2.1</u>	<u>173.115</u>
<u>Nonflammable</u>	<u>2</u>	<u>2.2</u>	<u>173.115</u>

<u>compressed gas</u>			
<u>Poisonous gas</u>	<u>2</u>	<u>2.3</u>	<u>173.115</u>
<u>Flammable and combustible liquid</u>	<u>3</u>	---	<u>173.120</u>
<u>Flammable solid</u>	<u>4</u>	<u>4.1</u>	<u>173.124</u>
<u>Spontaneously combustible materials</u>	<u>4</u>	<u>4.2</u>	<u>173.124</u>
<u>Dangerous when wet material</u>	<u>4</u>	<u>4.3</u>	<u>173.124</u>
<u>Oxidizers</u>	<u>5</u>	<u>5.1</u>	<u>173.127</u>
<u>Organic peroxides</u>	<u>5</u>	<u>5.2</u>	<u>173.128</u>
<u>Poisonous materials</u>	<u>6</u>	<u>6.1</u>	<u>173.132</u>
<u>Infectious substances (Etiological agents)</u>	<u>6</u>	<u>6.2</u>	<u>173.134</u>
<u>Radioactive materials</u>	<u>7</u>	---	<u>173.403</u>
<u>Corrosive materials</u>	<u>8</u>	---	<u>173.136</u>
<u>Miscellaneous hazardous materials</u>	<u>9</u>	---	<u>173.140</u>
<u>Other regulated materials: ORM-D</u>	<u>None</u>	---	<u>173.144</u>

A new subsection A.13.1.3 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

A13.1.3 See Table A.13.1.2

A new subsection A.13.1.5 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2004 edition, is adopted to read as follows:

A13.1.5 See Table A.13.1.2