

Section 41. The National Fire Protection Association (NFPA) Standard 502, Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2008 edition, is amended as follows:

3.2.2* Authority Having Jurisdiction (AHJ). ~~An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.~~ The fire chief or other designated authority charged with the administration of the fire code, or a duly authorized representative.

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 2009 Seattle Fire Code and Chapter 33 of the 2009 Seattle Building Code shall apply, except as modified herein.

4.3.2* Limited Access Highways. Fire protection for limited access highways shall comply with the requirements of Chapter 5 and Chapter 9 .

4.3.3 Bridges and Elevated Highways. Fire protection for bridges and elevated highways shall comply with the requirements of Chapter 6 and Chapter 9 .

4.3.4* Depressed Highways. ~~((Standpipe systems or fire extinguishers, or both, shall be installed on depressed highways where physical factors prevent or impede access to the water supply or fire apparatus.))~~ Fire protection for depressed highways shall comply with the requirements of Chapter 5 and Chapter 9.

4.3.5* Road Tunnels. Fire protection for road tunnels shall comply with the requirements of Chapter 7 and Chapter 9 .

4.3.6* Roadway Beneath Air-Right Structures. Fire protection for roadways that are located beneath air-right structures shall comply with the requirements of Chapter 8 and Chapter 9 .

4.5 Emergency Communications.

Emergency communications, ~~((where))~~ if required by the authority having jurisdiction, shall be provided by the installation of outdoor-type emergency telephone boxes, ~~((coded alarm telegraph stations,))~~ radio transmitters, or other approved devices that 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) Where practicable, 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 an approved constantly attended location.

Chapter 5 Limited Access and Depressed Highways

~~((5.3* Fire Hydrants. (Reserved)))~~***

6.3* ~~((Standpipe))~~ Fire Hydrants 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) to a fire hydrant, the bridge or elevated highway shall be provided with a ~~((standpipe))~~ hydrant system in accordance with the requirements of Chapter 9.

6.5 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.

7.4 Fire Alarm and Detection.

~~7.4.1 ((At least two systems to detect, identify, or locate a fire in a tunnel shall be provided, including one manual means meeting the requirements of 7.4.1.2 and either a closed-circuit television (CCTV) system in accordance with 7.4.1.3 or an automatic fire detection system in accordance with 7.4.1.4.))~~ All fire alarm, detection, supervisory, and trouble signals shall be distinctly different and shall be automatically transmitted to a central station service that is listed in the current edition of the Underwriters Laboratories FIRE PROTECTION EQUIPMENT DIRECTORY under the category Central Station (UUFX) as a Full Service Company or as a Fire Alarm Service--Local Company which subcontracts the monitoring, retransmission and associated record keeping and reporting to a listed Full Service Company or Monitoring Company. The listing shall indicate that the Full Service Company or Fire Alarm Service - - Local Company provides service to the Seattle area.

Exception: The operations control center may serve as a proprietary supervising station in accordance with NFPA 72 where approved by the authority having jurisdiction.

7.4.1.1* ((~~For systems other than manual systems, the performance of such systems shall include details of the fire signature required to initiate alarm.~~)) At least one automatic fire detection system to identify and locate a fire in a tunnel shall be provided.

7.4.1.2 Automatic fire detectors, including fixed water-based fire-fighting system water flow alarm-initiating devices, shall be installed in accordance with the requirements of NFPA 72.

7.4.1.3 Automatic fire detectors and fixed water-based fire-fighting system water flow alarm-initiating devices protecting the roadway and ancillary spaces within tunnels (pump stations, utility rooms, cross-passages, ventilation structures) and other areas shall be supervised by automatic fire alarm systems.

7.4.1.4 Spot detectors shall have a light that remains on until the device is reset, or shall be provided with remote alarm or supervisory indication in a location acceptable to the authority having jurisdiction.

7.4.1.5 Automatic fire detection systems for zoned deluge fixed water-based fire-fighting systems within a tunnel shall be zoned to correspond with the fixed water-based fire-fighting system zones.

7.4.1.6 Automatic fire detection systems within a tunnel shall be zoned to correspond with the tunnel ventilation zones if tunnel ventilation is provided.

~~((7.4.1.2 Manual Fire Alarm Boxes~~

~~7.4.1.2.1 Manual fire alarm boxes mounted in NEMA Enclosure Type 4 (IP 65) or equivalent boxes shall be installed at intervals of not more than 90 m (300 ft) and at all cross passages, and means of egress from the tunnel.~~

~~7.4.1.2.2 The manual fire alarm boxes shall be accessible to the public and the tunnel personnel.~~

~~7.4.1.2.3 The location of the manual fire alarm boxes shall be approved.~~

~~7.4.1.2.4 The alarm shall indicate the location of the manual fire alarm boxes at the monitoring station.~~

~~7.4.1.2.5 The system shall be installed, inspected, and maintained in compliance with NFPA 72.~~

~~7.4.1.3 Closed-Circuit Television (CCTV) Systems.~~

~~7.4.1.3.1 CCTVs with or without traffic flow indication devices shall be permitted to identify fires in tunnels with 24-hour supervision.~~

~~7.4.1.3.2* Ancillary spaces within tunnels (pump stations, utility rooms, cross passages, ventilation structures) and other areas shall be supervised by automatic fire alarm systems.))~~

~~((*A.7.4.1.3.2 Examples of these areas include the following:~~

~~(1) Pump stations~~

~~(2) Utility rooms~~

~~(3) Cross passages~~

~~(4) Ventilation structures.))~~

~~((7.4.1.4 Automatic Fire Detection Systems:~~

~~7.4.1.4.1 Automatic fire detection installed in accordance with the requirements of NFPA 72 shall be installed in tunnels where 24-hour supervision is not provided.~~

~~7.4.1.4.2 Where a fire detection system is installed in accordance with the requirements of 7.4.1.4.1, signals for the purpose of evacuation and relocation of occupants shall not be required.~~

~~7.4.1.4.3 Where a fire detection system is installed in accordance with the requirements of 7.4.1.4.1, the system shall be for fire detection only.~~

~~7.4.1.4.4 Automatic fire detection systems shall be capable of identifying the location of the fire within 15 m (50 ft).~~

~~7.4.1.4.5 Spot detectors shall have a light that remains on until the device is reset~~

~~7.4.1.4.6 CCTV systems used for automatic fire detection shall be permitted when listed for the intended purpose and installed in accordance with the manufacturers' requirements and NFPA 72~~

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~~7.4.1.4.7 Automatic fire detection systems within a tunnel shall be zoned to correspond with the tunnel ventilation zones where tunnel ventilation is provided.))~~

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7.4.3 Closed-Circuit Television (CCTV) Systems.

7.4.3.1 CCTVs shall be provided, and shall be capable of identifying the location of the fire within 15 m (50 ft).

7.4.3.2 CCTVs with or without traffic-flow indication devices may automatically identify fires in tunnels if all of the components of the video image fire detection system, including hardware and software, are listed for the purpose of fire detection.

7.4.4 Emergency Telephones.

7.4.4.1 Emergency telephones shall be installed at intervals of not more than 90 m (300 ft) and at all cross-passages, standpipe hose connection locations, and means of egress from the tunnel.

7.4.4.2 The location of the emergency telephones during off-hook condition shall be indicated at the monitoring station.

7.4.5 Emergency Communication System

7.4.5.1 An approved Emergency Communication System in accordance with the 2010 edition of NFPA 72 shall be provided within the tunnel.

7.4.5.2 The Emergency Communication System shall include fire alarm system strobes at all tunnel egress doors.

7.4.6 Fire Command Center. If required by the authority having jurisdiction, road tunnels shall be provided with a fire command center in accordance with Section 509 of the 2009 Seattle Fire Code.

7.5(~~(*)~~) Communication Systems.

~~((A.7.5 Radio communications systems, such as highway advisory radio (HAR) and AM/FM commercial station overrides, can be provided to give motorists information regarding the nature of the emergency and the actions the motorist should take. All messaging systems should be capable of real time composition. The communications system can also feature a selection of prerecorded messages for broadcasting by the emergency response authority. Areas of refuge or assembly, if available, should be provided with reliable two-way voice communications to the emergency response authority.))~~

7.5.1 If required by the authority having jurisdiction, (~~(In)~~) new and existing tunnels and ancillary structures(~~(, wherever necessary for dependable and reliable communications, a separate radio network capable of two-way radio communication for fire department personnel to the fire department communication center)~~) shall be provided with an emergency responder radio system in accordance with Section 510 of the 2009 Seattle Fire Code.

7.9.1 Fixed water-based fire-fighting systems (~~(shall be permitted)~~) are required in road tunnels as part of an integrated approach to the management of fire and life safety.

7.9.1.1 Fixed water-based fire-fighting systems in road tunnels shall be designed and installed in accordance with NFPA 13.

7.9.1.2 Minimum protection of the roadway shall be in accordance with NFPA 13 for Extra Hazard Group 2. If flammable liquids and/or hazardous materials will be present, protection shall be based on an engineering analysis and approved by the authority having jurisdiction.

7.9.1.3 Protection of electrical rooms and mechanical spaces shall be in accordance with NFPA 13 for Ordinary Hazard Group 1.

7.9.1.4 Protection of exit enclosures shall be in accordance with NFPA 13 for Light Hazard.

| 7.14.3 Maintenance. The means of egress shall be maintained in accordance with ((NFPA 1)) Chapter 10 of the 2009 Seattle Fire Code.

7.14.6.3* Egress Pathway.

A.7.14.6.3 The maximum means of egress travel speed shall be computed for reduced visibility due to a smoke filled environment. The travel speed for such environment is in the range of 0.5 -- 1.5 m/s (100 -- 300 fpm) depending on visibility, illuminance, design of exit signs and egress pathway.

7.14.6.3.1 The tunnel roadway surface, if supported by a traffic management system, shall be considered part of the egress pathway.

7.14.6.3.2 If walkways are provided for egress purposes, the walkway egress path shall have a minimum clear width of 1.12 m (3.6 ft), lead directly to an emergency exit, and be protected from traffic.

7.14.6.4 The emergency exits shall be separated from the tunnel by a minimum of a 2-hour fire-rated construction enclosure having a Class A interior finish as defined in the 2009 Seattle Building Code.

7.14.6.5 Emergency exits shall be pressurized in accordance with NFPA 92A, 2009 edition, with doors meeting the requirements of Section 7.14.5.

7.14.6.6 If portals of the tunnel are below surface grade, surface grade shall be accessible by a stair, vehicle ramp, or pedestrian ramp.

7.14.6.7 If cross-passageways are to be used as emergency exits, provisions shall be to stop all traffic operation in the adjacent tunnel when the cross-passageways are in use.

Chapter 9 Standpipe, Fire Hydrants, and Water Supply

9.1.4.3 (~~Heat trace material shall be listed for the intended purpose and supervised for power loss.~~) Heat tracing systems for freeze protection for standpipes shall be in accordance with Seattle Fire Department Administrative Rule 9.03.09, Automatic Sprinkler and Standpipe Systems and any future revisions of this rule adopted by the authority having jurisdiction.

9.2 Standpipe Water Supply

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))~~

Standpipes shall be sized to provide 1000 gpm. Hydraulic calculations shall be based on 500 gpm at 130 psi at the hydraulically most remote hose connection, with a simultaneous flow of 500 gpm at the next hydraulically most remote hose connection. The maximum calculated pressure at any point in the system shall not exceed 350 psi.

9.3.1 Fire department connections shall be of the threaded (~~two-way or three-way~~) 65- mm (2 1/2-in) four-way type(~~or shall consist of one 100 mm (4 in.) quick-connect coupling that is accessible~~)).

9.4 Standpipe Hose Connections

9.4.2 (~~Hose connection spacing shall not exceed more 85 m (275 ft).~~) Dual 65-mm (2 1/2-in) hose connection outlets having separate valves shall be provided at each hose connection location.

9.7 Fire Hydrants and Water Supply.

9.7.1 Fire hydrants for limited access and depressed highways shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.

9.7.2 Fire hydrants for 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 a fire hydrant.

9.7.3 Fire hydrants for road tunnels shall be provided so that no location on the protected roadway is more than 45 m (150 ft) from a fire hydrant.

9.7.4 The water supply for fire hydrants shall provide a minimum of 1,000 gpm (63 L/s) at 20 psi (138 kPa) flowing independently, and a minimum of 1,500 gpm (34 L/s) at 20 psi (138 kPa) with two fire hydrants flowing simultaneously.

9.8 Bridges and Elevated Highways.

9.8.1 Fire hydrants for bridges and elevated highways shall be provided in accordance with this section and Section 9.7.

9.8.2 If 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.

9.8.3 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 a hand-operable valve readily accessible from the roadway.

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

Exception: The outlets may be angled in towards the roadway at an angle not exceeding 22.5 degrees.

9.8.5 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.

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

9.8.7 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.

9.8.8 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.

9.8.9 Access to the preaction or deluge valves and manual actuation capability at the valve locations shall be provided, including access key box if the water supply vault will be locked.

9.8.10 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.

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

9.8.12 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.

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

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

9.8.15 Water supply vault location information, vault access instructions, and a phone number for road crew to drain the system shall be provided at the roadway control panel push button location.

9.8.16 If used, heat tracing systems for freeze protection for hydrant systems shall be in accordance with Seattle Fire Department Administrative Rule 9.03.09, Automatic Sprinkler and Standpipe Systems and any future revisions of this rule adopted by the authority having jurisdiction.

9.9 Maintenance and Confidence Testing

9.9.1 Standpipe and hydrant systems shall be inspected and tested at least annually.

9.9.2 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 by the owner, and are separate from fire department inspections.

9.9.3 The person, firm or corporation performing such work shall have a Type STP-1 certificate from the fire department. See Administrative Rules 9.01.09, Certification for Installing, Maintaining and Testing Life Safety Systems and Equipment and Administrative Rule 9.02.09, Confidence Test Requirements for Life Safety Systems.

9.10 Standpipe Installations in Tunnels Under Construction.

9.10.1 A standpipe system shall be installed in tunnels under construction in accordance with 9.10.1.1 and 9.10.1.2.

9.10.1.1 A standpipe system shall be installed before the tunnel under construction has exceeded a length of 61 m (200 ft) beyond any access shaft or portal and shall be extended as work progresses to within 61 m (200 ft) of the most remote portion of the tunnel.

9.10.1.2 Standpipes shall be sized for approved water flow and pressure at the outlet, based upon the maximum predicted fire load.

10.1.1.1 If an engineering analysis is not conducted, or does not support the use of natural ventilation for the configurations described in 10.1.1, a mechanical emergency ventilation system shall be provided.

10.1.1.2 The engineering analysis of the ventilation system shall include a validated subway analytical simulation program augmented as appropriate by a quantitative analysis of airflow dynamics produced in the fire scenario, such as would result from the application of validated computational fluid dynamics (CFD) techniques.

10.1.1.3 The results of the analysis shall include the no-fire (or cold) air velocities that can be measured during commissioning to confirm that a mechanical ventilation system as built meets the requirements determined by the analysis.

10.5.1* The design fire size [heat-release rate] shall consider the types of vehicles that are expected to use the tunnel.

Table A.10.5.1 Fire Data for Typical Vehicles

Vehicles	Peak Fire Heat-Release Rates
	(MW)
Passenger car	((5))10
Multiple passenger cars (2-4 vehicles)	((10))20
Bus	((20))30
Heavy goods truck	((70))200
Tanker*	((200))300

11.4* Emergency Power Supply System (EPSS). Road tunnels shall be provided with a Class 2 ((+)), Type 60, Level 1 (~~emergency power~~) Emergency Power Supply System (EPSS) in accordance with Article 700 of NFPA 70 and (~~with~~) Chapter 4 of NFPA 110.

A.11.4 It is expected that the operations of all systems within the vicinity of a fire can fail. Section 11.4 is intended to limit the area of such failure. The class defines the minimum time, in hours, that the Emergency Power Supply System (EPSS) is designed to operate at its rated load without being refueled or recharged. The type defines the maximum time, in seconds, that the EPSS will permit the load terminals of the transfer switch to be without acceptable electrical power. NFPA 110 recognizes two levels of EPSS equipment installation, performance and maintenance. Level 1 systems shall be installed if failure of the EPSS to perform could result in loss of human life or serious injuries.

11.4.1 The following systems shall be connected to the emergency power supply system:

- (1) Emergency voice/alarm communication systems (~~lighting~~)
- (2) Traffic control system(s)
- (3) Exit signs and means of egress illumination
- (4) (~~Communication~~) Lighting for mechanical rooms.
- (5) Tunnel drainage system(s)
- (6) Ventilation and automatic fire detection equipment for smoke proof enclosures.
- (7) Automatic Fire detection systems
- (8) Security system(s)
- (9) Closed-circuit television or video system(s)
- (10) Smoke control systems.
- (11) Electrically powered fire pumps.
- (12) Power and lighting for the fire command center.
- (13) Fire alarm systems.
- (14) Elevator car lighting.

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 and the specific facility(s) the plan covers
- (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 operations control center (OCC) and alternative location(s) as applicable
 - a. Procedure for staffing the backup location(s) shall be specified
 - b. Procedure to control risk while the OCC does not have staff until the backup facility can take over.
- (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 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

12.5.1.1* The OCC may serve as a proprietary supervising station to allow direct receipt of alarms where approved by the authority having jurisdiction.

A.12.5.1.1 Expanding the OCC functions to be a proprietary supervising station will allow faster and more coordinated control and monitoring of the various fire and life safety systems. This will expedite emergency functioning by eliminating delays from a central supervising station company. A proprietary station has significant requirements under NFPA 72 that should be fully understood before adopting this as a policy and practice.

12.5.1.2 For the OCC to be a proprietary supervising station, it shall meet the relevant requirements of NFPA 72.

12.8.4 Limited Access Highways and Road Tunnels .

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

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

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

Exceptions:

(1) The existing Mount Baker Tunnel (Interstate-90) and the Washington State Convention and Trade Center lid (Interstate-5) if 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.

A.13.1 Hazardous Material. A substance or material, including a hazardous substance, that 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.

13.1.1 ((~~* The authority having jurisdiction shall adopt rules and regulations that apply to the transportation of regulated and unregulated cargoes.~~)) Flames used for heating vehicles or loads shall be extinguished before the vehicle enters the road tunnel or its approaches.

13.1.2 ~~* ((Design and planning of the facility shall address the potential risk presented by regulated and unregulated cargoes as permitted by 13.1.1.))~~ Vehicles transporting hazardous materials in quantities that require DOT placards in accordance with 49 CFR are prohibited in road tunnels.

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 compressed gas</u>	<u>2</u>	<u>2.2</u>	<u>173.115</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>---</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>---</u>	<u>173.403</u>
<u>Corrosive materials</u>	<u>8</u>	<u>---</u>	<u>173.136</u>
<u>Miscellaneous hazardous materials</u>	<u>9</u>	<u>---</u>	<u>173.140</u>
<u>Other regulated materials: ORM-D</u>	<u>None</u>	<u>---</u>	<u>173.144</u>

13.1.4 Tank vehicles that are empty, or that have a residue, or vehicles transporting empty containers are prohibited from entering road tunnels if they previously transported the following hazardous materials:

(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)

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;

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

(1) Vehicle has a dedicated alternative-fuel system installed by the manufacturer of the vehicle. (2) Vehicle has a fuel system that 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.

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