NFPA No.

415

AIRCRAFT FUELING RAMP DRAINAGE 1966

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Official NFPA Definitions

Adopted Jan. 23, 1964. Where variances to these definitions are found, efforts to eliminate such conflicts are in process.

SHALL is intended to indicate requirements.

SHOULD is intended to indicate recommendations or that which is advised but not required.

APPROVED means acceptable to the authority having jurisdiction. The National Fire Protection Association does not approve, inspect or certify any installations, procedures, equipment or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure or use. The authority having jurisdiction may also refer to the listings or labeling practices of nationally recognized testing laboratories,* i.e., laboratories qualified and equipped to conduct the necessary tests, in a position to determine compliance with appropriate standards for the current production of listed items, and the satisfactory performance of such equipment or materials in actual usage.

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LISTED: Equipment or materials included in a list published by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

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AUTHORITY HAVING JURISDICTION: The organization, office or individual responsible for "approving" equipment, an installation, or a procedure.

Units of Measurements

Units of measurements used here are U. S. standard. 1 U. S. gallon = 0.83 Imperial gallons = 3.785 liters. One foot = 0.3048 meters. One inch = 25.40 millimeters. One pound per square inch = 0.06805 atmospheres = 2.307 feet of water. One pound = 453.6 grams.

Aircraft Fueling Ramp Drainage

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1966 Edition of No. 415

This Standard is the work of the NFPA Sectional Committee on Aircraft Hangars and Airport Facilities which reports to the Association through the NFPA Committee on Aviation. This 1966 Edition was adopted at the Annual Meeting of the Association held in Chicago, Ill., May 16–20, 1966. It supersedes the 1961 Edition. The only substantive change to the 1961 Edition is the addition of Paragraph 38; two of the diagrams (Figures 1 and 3) have been redrawn to improve their legibility.

Origin and Development of No. 415

In 1960, the Committee secured Tentative Adoption of this Standard and Official Adoption followed in 1961. In compliance with NFPA Regulations Governing Technical Committees, the 1961 edition was reviewed by the Committee for reconfirmation in 1966, a five-year period having passed. In this review, it was agreed that with the addition of Paragraph 38, the Standard was adequate for the purposes for which it was written.

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Standard on
AIRCRAFT FUELING RAMP DRAINAGE

NFPA No. 415 — 1966

10. Definitions.

11. An AIRCRAFT FUELING RAMP, as used herein, shall mean any outdoor area at an airport, including aprons and hardstands, on which aircraft are normally fueled or defueled.

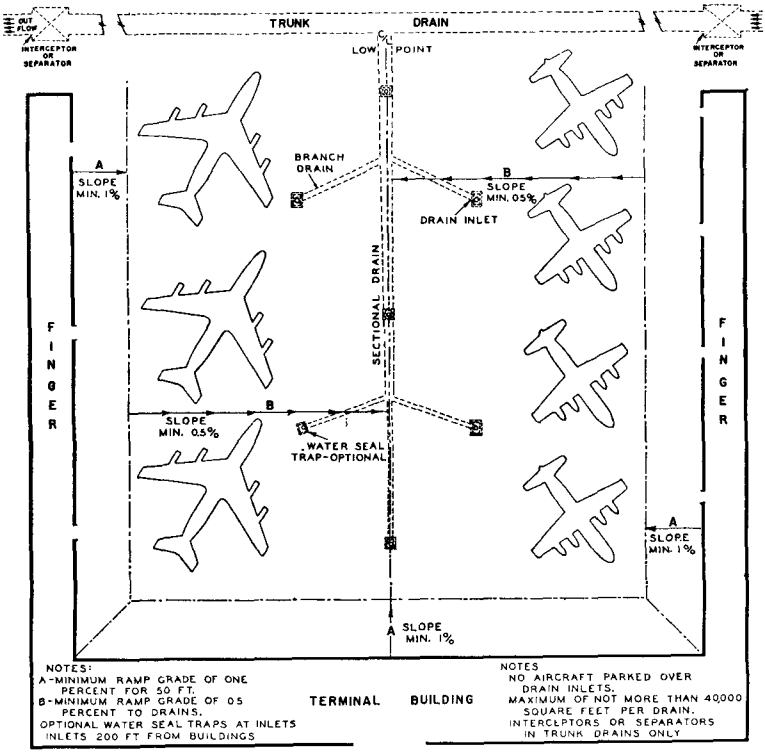

Figure 1. One possible arrangement of an aircraft fueling ramp drainage system using the optional trapped drain inlets.

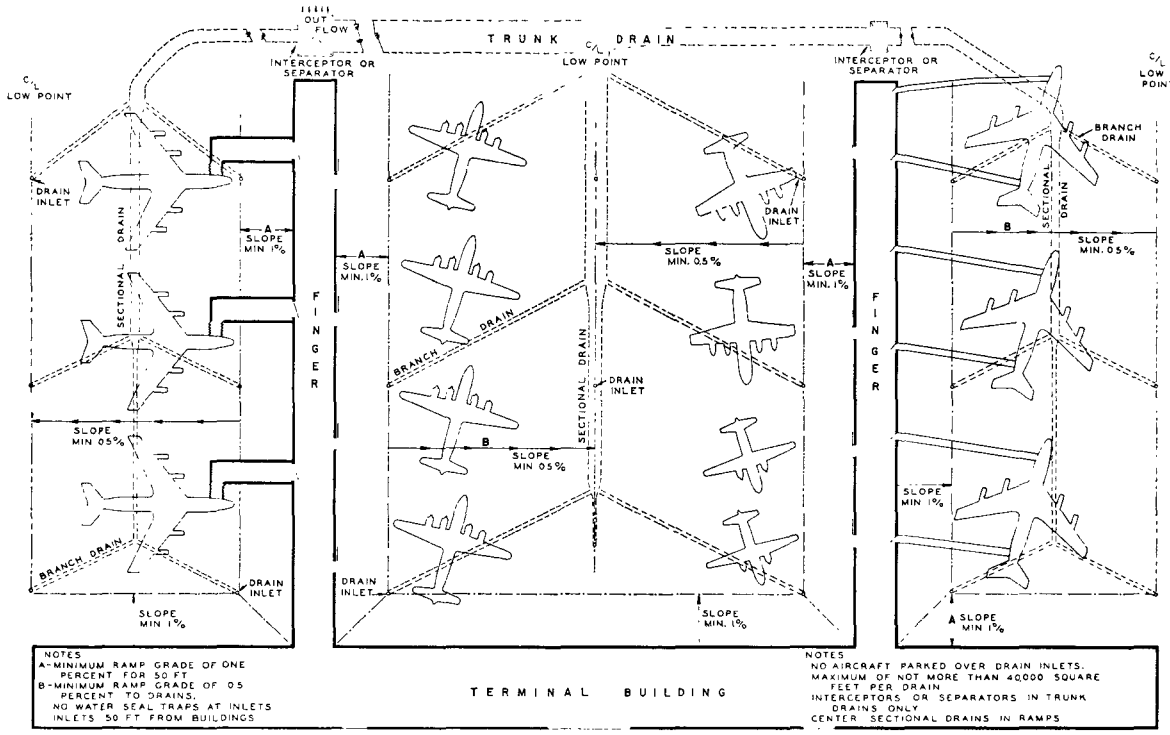

Figure 2. Another possible arrangement of an aircraft fueling ramp drainage system using drainage inlets without the optional water seal traps.

20. Purpose.

21. The drainage recommendations herein shall be included in the design of the water drainage system of an aircraft fueling ramp to control the flow of fuel which may be spilled on a ramp and to minimize the resultant possible danger therefrom. Such a drainage system is intended:

a. To prevent spread of the fuel spill* to structures,† passenger loading fingers,† or concourses which might result in the liquid or vapors therefrom reaching a source of ignition or might result in the release of dangerous or toxic vapors therein.

b. To prevent spread of the fuel spill* over large areas of the ramp surface and the transmission of vapors by the drainage system which may expose a number of aircraft or other equipment parked or operating on the ramp.

c. To prevent continued exposure of the spilled liquids* to the air and the uncontrolled vaporization of the fuel on ramp surfaces which might result in the creation of serious fire hazard exposure conditions or the release of uncontrolled quantities of vapors creating potential hazards to life and property.

d. To provide for the safe disposal of fuel spillage* (see also Paragraph 33).

30. Aircraft Fueling Ramp Slope and Drain Design.

31. Aircraft fueling ramps shall slope away from terminal buildings,† fingers,† aircraft hangars† or other structures, with a minimum grade of one per cent (1:100) for the first 50 feet. Beyond this distance, the slope to drainage inlets may be reduced to a minimum of 0.5 per cent (1:200). Drainage inlets, where provided, shall be a minimum of 50 feet from such structures.

NOTE: Consideration should be given to the hydraulic problem in disposal of surface water, safe disposal of fuel which might be spilled on the ramp, and the gradient to be overcome in the movement of aircraft. A ratio of 40,000 square feet per drainage inlet should not be exceeded with minimum flow distances to drains but with drain inlets located so as not to endanger aircraft placements within the ramp area so described.

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*See also NFPA Standard on Aircraft Fueling on the Ground (No. 407).

†See also NFPA Standards on Aircraft Hangars (No. 409) and Airport Terminal Buildings (No. 416).

32. Effective aircraft fueling ramp drainage as specified herein may be accomplished by any one or a combination of the following methods:

a. Use of drain inlets with connected piping.

b. Use of open grate trenches as a collection means with connected piping.

c. Sloping of the ramp.

NOTE: The use of slopes alone on aircraft fueling ramps is the least desirable method. The use of slopes and open grate trenches as a collection means with connected piping to dispose of fuel spills is preferable to the use of slopes alone, but is not as desirable for major airports as the use of slopes and drain inlets with connected piping.

33. The water drainage system of any aircraft fueling ramp shall be so arranged that the fuel or its vapor cannot normally enter into the drainage systems of: buildings, areas utilized for automobile parking, public or private streets, or the public side of airport terminal† or aircraft hangar† structures. In no case shall the design allow fuel to collect on the aircraft fueling ramp or adjacent ground surfaces where it may constitute a fire hazard, or result in a hazardous subsurface accumulation of such fuel.

34. The drainage system designer should locate inlets to allow reasonable flexibility in parking of aircraft without a resulting problem of aircraft being positioned over inlets.

NOTE: Aircraft should not be parked over any drainage system inlet. It is accordingly recommended that aircraft fueling ramp personnel be fully instructed and informed on the purposes of the drainage system used and the importance of properly locating aircraft with respect to the drainage inlets provided.

35. Sections of drainage systems shall be isolated at intervals as governed by local conditions through the use of water seal traps or specially designed approved devices (such as interceptors or separators) to prevent transmission of flame or vapor through the underground piping system.

NOTE: What constitutes a "section" of a drainage system will depend on the physical arrangement of the drainage system, the types of operations on the ramps, and the proximity of exposed airport structures.

†See also NFPA Standards on Aircraft Hangars (No. 409) and Airport Terminal Buildings (No. 416).

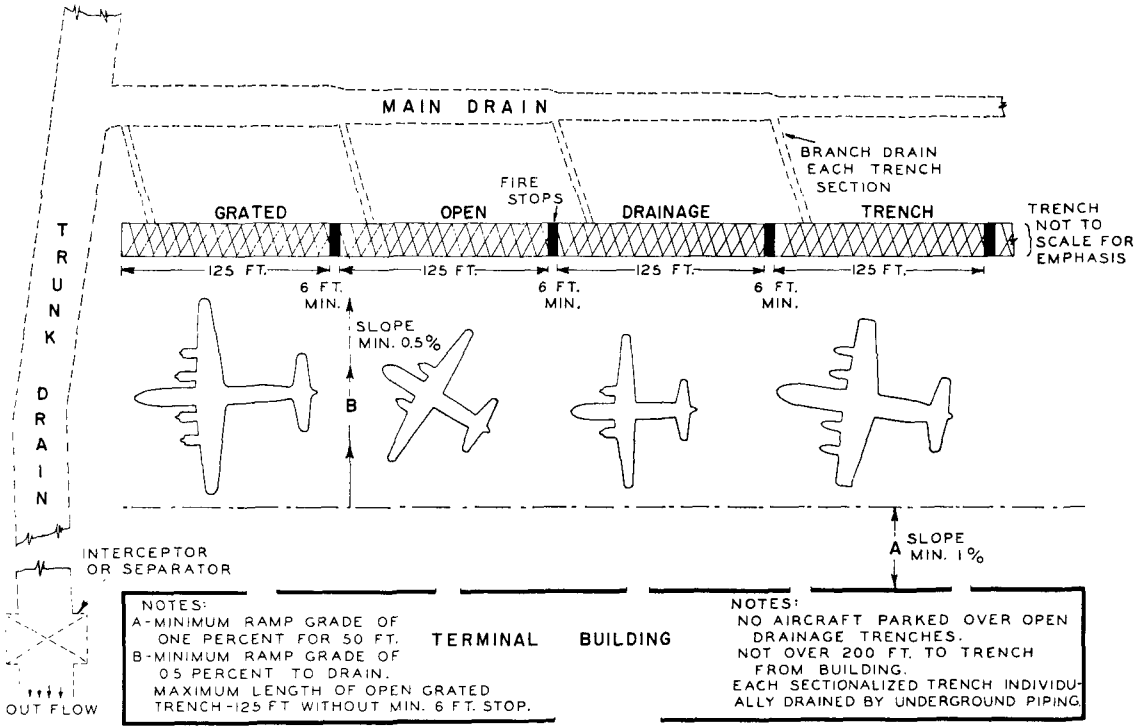

Figure 3. Another possible arrangement of an aircraft fueling ramp drainage system using a grated open drainage trench.

The judgment on how to sectionalize the system must thus be determined by local conditions.

a. Where climatic conditions would render traps unserviceable for extended periods of time because of freezing or drying out of the water seals, reliance cannot be placed on these devices.

b. If interceptors or separators are used, they shall be located where readily accessible for inspection and maintenance and vents shall be run to a safe location. It is recommended that the minimum retention capacity of the interceptor or separator system be based on 25 per cent of the total fuel capacity of the largest aircraft likely to be serviced on the aircraft fueling ramp. Fuel discharged from separators shall drain to a safely located tank, cistern or sump. Accumulated fuel shall be removed from interceptors or separator systems periodically and disposed of in a safe location.

CAUTION

The final separator or interceptor for the entire airport drainage system shall be adequate to prevent disposal of flammable liquids into adjoining properties or waterways.

36. Grates and drain covers shall be removable to facilitate cleaning and flushing.

37. If open grate drainage trenches are used as a collection means, such open trenches, including branches, shall not be over 125 feet in length with a minimum interval of 6 feet between open trench sections to act as fire stops. Each 125-foot section shall be individually drained through underground piping. Open trenches shall not be used where they are in line of pedestrian or passenger traffic.

38. Underground piping used in drainage systems shall not have combustible interior coatings.

40. Drain and Separator Maintenance.

41. Periodic maintenance checks (not less than monthly and more often if climatic conditions dictate) and flushing with large volume water streams shall be conducted through all drains, separators and interceptors to assure that they are clear of obstructions and function properly.

42. Large volume flushing with water shall be conducted through appropriate drainage elements after any large fuel spill on the aircraft fueling ramp enters the drainage system.