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NFPA 415 Aircraft Fueling Ramp Drainage 1992 Edition

National Fire Protection Association 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101

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The Board of Directors reaffirms that the National Fire Protection Association recognizes that the toxicity of the products of combustion is an important factor in the loss of life from fire. NFPA has dealt with that subject in its technical committee documents for many years.

There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

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NFPA 415

Standard on

Aircraft Fueling Ramp Drainage

1992 Edition

This edition of NFPA 415, *Standard on Aircraft Fueling Ramp Drainage*, was prepared by the Technical Committee on Airport Facilities, released by the Correlating Committee on Aviation, and acted on by the National Fire Protection Association, Inc. at its Annual Meeting held May 18-21, 1992, in New Orleans, LA. It was issued by the Standards Council on July 17, 1992, with an effective date of August 14, 1992, and supersedes all previous editions.

The 1992 edition of this document has been approved by the American National Standards Institute.

Changes other than editorial are indicated by a vertical rule in the margin of the pages on which they appear. These lines are included as an aid to the user in identifying changes from the previous edition.

Origin and Development of NFPA 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 1966 one paragraph was added and two of the diagrams were redrawn to improve legibility. In 1973 the standard was revised to separate the mandatory ("shall") provisions from nonmandatory recommendations, which have been placed in the appendix. The standard was reconfirmed in 1977 and 1982. The standard was completely revised in 1987. This edition is a partial revision.

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NOTE: Membership on a Committee shall not in and of itself constitute an endorsement of the Association or any document developed by the Committee on which the member serves.

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Standard on

Aircraft Fueling Ramp Drainage

1992 Edition

NOTICE: An asterisk (*) following the number or letter designating a paragraph or subparagraph indicates explanatory material on that paragraph in Appendix A.

Information on referenced publications can be found in Appendix B.

Chapter 1 Administration

1-1 Scope. This standard specifies minimum requirements for the design and maintenance of the drainage system of an aircraft fueling ramp to control the flow of fuel that may be spilled on a ramp and to minimize the resulting possible danger.

1-2 Purpose. Such a drainage system is intended to limit the fire hazard from fuel spillage by:

(a) Controlling the spread of a fuel spill to limit exposure to buildings, aircraft loading walkways, concourses, or elevated structures; to prevent the fuel's liquid or vapors from reaching a source of ignition or accumulating within structures.

(b) Limiting the spread of the fuel spill over the ramp surface and preventing the transmission of vapors by the drainage system from exposing aircraft or other equipment parked or operating on the ramp.

1-3 Definitions.

Aircraft Fueling Ramp. Any outdoor area at an airport, including aprons and hardstands, on which aircraft are normally fueled or defueled.

Approved.* Acceptable to the "authority having jurisdiction."

Authority Having Jurisdiction.* The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

Shall. Indicates a mandatory requirement.

Should. This term, as used in the appendix, indicates a recommendation or that which is advised but not required.

1-4* Units. In this standard, values for measurements are followed by an equivalent in SI units, but only the first value stated shall be regarded as the requirement. Equivalent values in SI units shall not be considered as the requirements as these values may be approximate.

Chapter 2 Design

2-1 Aircraft Fueling Ramp Slope and Drain Design.

2-1.1* Aircraft fueling ramps shall slope away from terminal buildings, aircraft hangars, aircraft loading walkways, or other structures, with a minimum grade of one percent (1:100) for the first 50 ft (15.2 m). Beyond this distance, the ramp slope to drainage inlets may be reduced to a minimum of 0.5 percent (1:200).

2-1.2* Aircraft fueling ramp drainage as specified herein shall be accomplished by the provisions of 2-1.1 in conjunction with:

(a) Use of drain inlets with connected piping.

(b) Use of open grate trenches.

2-1.3* Drainage inlets, where provided, shall be located a minimum of 50 ft (15.2 m) from structures listed in 2-1.1.

2-1.4 The drainage system of any aircraft fueling ramp shall be so designed that the fuel or its vapor cannot enter into the drainage system 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.

2-1.5 The final separator or interceptor for the entire airport drainage system shall be designed to allow disposal of combustible or flammable liquids into a safely located, approved containment facility.

2-1.6 Grates and drain covers shall be removable to facilitate cleaning and flushing.

2-1.7* If open grate drainage trenches are used as a collection means, such open trenches, including branches, shall not be over 125 ft (38.1 m) in length with a minimum interval of 6 ft (1.8 m) between open trench sections to act as fire stops. Each 125-ft (38.1-m) section shall be individually drained through underground piping. Open trenches shall not be used where they are in line of pedestrian or passenger traffic.

2-1.8 Underground piping and components used in drainage systems shall be noncombustible and inert to fuel.

Chapter 3 Maintenance

3-1 Drain and Separator Maintenance.

3-1.1* Periodic maintenance checks shall be conducted of all ramp drainage systems and interceptors to ensure that they are clear of obstructions and function properly.

3-1.2 Large volume flushing with water shall be conducted through appropriate drainage elements to purge the residual fuel from these drainage elements after any large fuel spill on the aircraft fueling ramp enters the drainage system.

Appendix A Explanatory Material

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

A-1-3 Approved. 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 an organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

A-1-3 Authority Having Jurisdiction. The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction"; at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."

A-1-4 Units. Metric units of measurement in this standard are in accordance with the modernized metric system known as the International System of Units (SI). Two units (liter and bar), outside of but recognized by SI, are commonly used in international fire protection. These units are listed in Table A-1-4 with conversion factors.

The conversion procedure for the SI units has been to multiply the quantity by the conversion factor and then round the result to the appropriate number of significant digits.

Table A-1-4

Name of Unit	Unit Symbol	Conversion Factor
liter	L	1 gal = 3.785 L
liter per minute per square meter	$L/min/m^2$	1 gpm/ft^2 = 40.746 $L/min/m^2$
cubic decimeter	dm^3	1 gal = 3.785 dm^3
pascal	Pa	1 psi = 6894.757 Pa
bar	bar	1 psi = 0.0689 bar
bar	bar	1 bar = 10^5 Pa

For additional conversions and information see ASTM E380, *Standard for Metric Practice.*

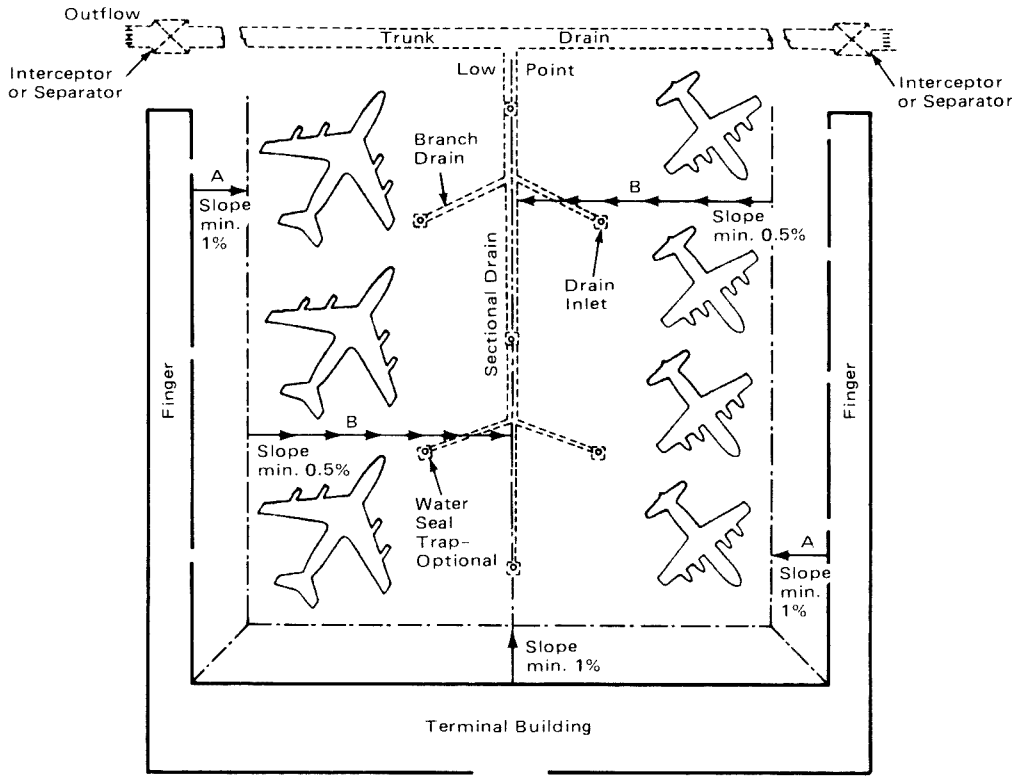
A-2-1.1 Consideration should be given to the hydraulic problem in disposal of surface water, safe disposal of fuel that might be spilled on the ramp, and the gradient to be overcome in the movement of aircraft. A ratio of 40,000 ft^2 (3716 m^2) per drainage inlet should not be exceeded with minimum flow distances to drains, but drain inlets should be located so as not to endanger aircraft placements within the ramp area so described.

A-2-1.2 Figures A-2-1.2 (a) and (b) illustrate two possible fueling ramp drainage arrangements.

A-2-1.3 NFPA 416, *Standard on Construction and Protection of Airport Terminal Buildings*, requires fixed fire protection for large expanses of glass where drains are located less than 100 ft (30.5 m) from the building.

A-2-1.7 The individual drain is intended to prevent flow of a spill in one trench from flowing through other trenches. Refer to Figure A-2-1.2(b).

A-3-1.1 It is suggested that maintenance checks be conducted at least four times a year and more often if climatic or other local conditions dictate.



Notes:
A–Minimum ramp grade of one percent for 50 ft (15 m)
B–Minimum ramp grade of 0.5 percent to drains.
Optional water seal traps at inlets.
Inlets 200 ft (61 m) from buildings.

Notes:
No aircraft parked over drain inlets.
Maximum of not more than 40,000 ft^2 (3716 m^2) per drain.
Interceptors or separators in trunk drains only.

Figure A-2-1.2(a) One possible arrangement of an aircraft fueling ramp drainage system using the optional trapped drain inlets.

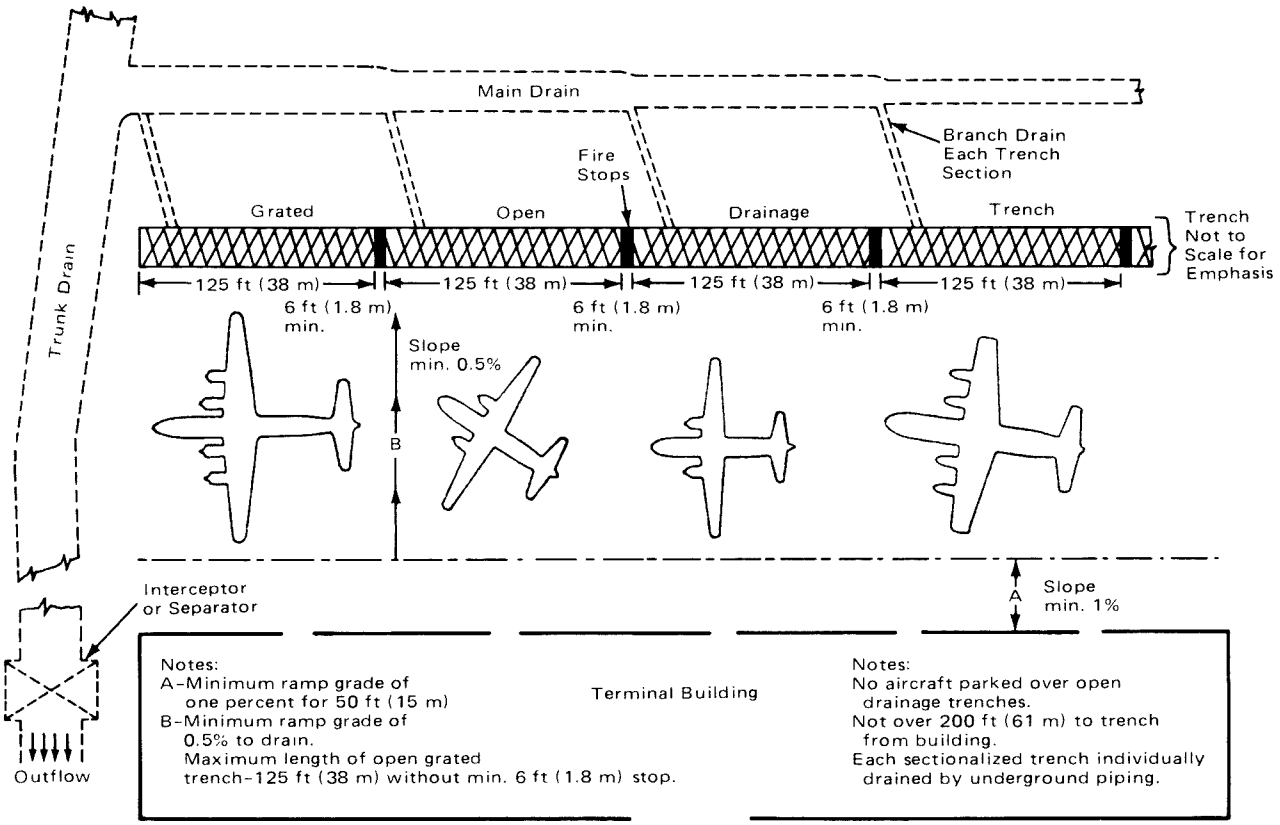


Figure A-2-1.2(b) Another possible arrangement of an aircraft fueling ramp drainage system using a grated open drainage trench.

Appendix B Referenced Publications

B-1 The following documents or portions thereof are referenced within this standard for informational purposes only and thus are not considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

B-1.1 NFPA Publication. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 416, *Standard on Construction and Protection of Airport Terminal Buildings*, 1987 edition.

B-1.2 ASTM Publication. American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E380-1991, *Standard for Metric Practice*.

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Contact NFPA Standards Administration for final date for receipt of proposals on a specific document.

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INSTRUCTIONS

Use a separate proposal form for submitting each proposed amendment.

1. Type or print legibly in black ink.

2. Indicate the number, edition year, and title of the document. Also indicate the specific section or paragraph that the proposed amendment applies to.

3. Check the appropriate box to indicate whether this proposal recommends adding new text, revising existing text, or deleting text.

4. In the space identified as "Proposal" indicate the exact wording you propose as new or revised text, or the text you propose be deleted.

5. In the space titled "Statement of Problem and Substantiation for Proposal" state the problem which will be resolved by your recommendation and give the specific reason for your proposal. Include copies of test results, research papers, fire experience, or other materials that substantiate your recommendation.

6. Check the appropriate box to indicate whether or not this proposal is original material, and if it is not, indicate the source of the material.

7. Sign the proposal.

If supplementary material (photographs, diagrams, reports, etc.) is included, you may be required to submit sufficient copies for all members and alternates of the technical committee. The technical committee is authorized to abstract the "Statement of Problem and Substantiation for Proposal" if it exceeds 200 words for publication in the Technical Committee Reports.

NOTE: The NFPA Regulations Governing Committee Projects in Paragraph 10-10 state: Each proposal shall be submitted to the Council Secretary and shall include:

(a) identification of the submitter and his affiliation (Committee, organization, company) where appropriate, and

(b) identification of the document, paragraph of the document to which the proposal is directed, and

(c) a statement of the problem and substantiation for the proposal, and

(d) proposed text of proposal, including the wording to be added, revised (and how revised), or deleted.

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Fax No.: 617-770-3500

Note: All proposals must be received by 5:00 p.m. E.S.T./E.D.S.T. on the published proposal closing date.

Date 5/18/85 Name John B. Smith Tel. No. 617-555-1212

Address 9 Seattle St., Seattle, WA 02255

Representing (Please indicate organization, company or self) Fire Marshals Assn. of North America

1. a) Document Title: Protective Signaling Systems NFPA No. & Year NFPA 72D

b) Section/Paragraph: 2-7.1 (Exception)

FOR OFFICE USE ONLY
Log #:
Date Rec'd:
Proposal #:

2. Proposal recommends: (Check one)
☐ new text
☐ revised text
☒ deleted text.

3. Proposal (include proposed new or revised wording, or identification of wording to be deleted):

Delete exception.

SAMPLE

4. Statement of Problem and Substantiation for Proposal:

A properly installed and maintained system should be free of ground faults. The occurrence of one or more ground faults should be required to cause a "trouble" signal because it indicates a condition that could contribute to future malfunction of the system. Ground fault protection has been widely available on these systems for years and its cost is negligible. Requiring it on all systems will promote better installations, maintenance and reliability.

5. ☒ This Proposal is original material.
☐ This Proposal is not original material; its source (if known) is as follows: _____

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Signature (Required)

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