Report of Correlating Committee on Mobile Homes and Recreational Vehicles

The Report of the Correlating Committee on Mobile Homes and Recreational Vehicles and its 4 Sectional Committees is presented in 4 major Parts, with each Part subdivided into 2 Sections.

The reason for separating each Part into 2 Sections is that the electrical provisions of each of the 4 Parts were developed through an Intersectional Committee Electrical Task Force which worked closely with Code-Making Panel No. 19 of the National Electrical Code Committee “to harmonize” the provisions relating to Mobile Homes, Mobile Home Parks, Recreational Vehicles, and Recreational Vehicle Parks with Articles 550 and 551 of the National Electrical Code. Balloting was done separately on the electrical provisions due to the sequencing of the availability of the revisions.

Explaination of Proposed Revisions

Part I. Proposed Revisions to the Standard for Mobile Home Parks (NFPA No. 501A — 1973). Part IA contains proposed revisions to update the Standard except for Part 8. These revisions include some editorial refinements (Items 1, 2, 3, 4, 6, 8, 9, 10, 19, 23, and 26); changing some of the permissive language to mandatory requirements (Items 5, 7, 20, 21, 22, 24, 25, 27, and 28); introducing substantive new or revised material (Items 11, 12, 13, 14, 15, 16, 17, 18 and 27). Revisions to Part 8 (Mobile Home Park Electrical Systems), to correlate with the Proposed 1974 National Electrical Code, are covered in Part IIB of this Report.

Part III. Proposed Revisions to Standard for Recreational Vehicles (NFPA No. 501C — 1972) Part IIIA contains proposed revisions to update the Standard except for Part III. There are 93 separate "Items" in these Proposed Revisions; Items 1–4 concern the Introductory Chapter (Definitions Common to Parts I–IV); Items 5–61 concern Part I (Plumbing Systems); Items 62–92 concern Part II (Heating Systems); and Item No. 93 proposes new Part IV (Fire and Life Safety). Significant new material is contained in Items 3, 5, 10, 11, 16, 23, 27, 31, 34, 35, 40, 46, 47, 52–53, 55–56, 58, 61, 63, 68, 70, 72, 76, 77 (Table); 78, 80, 81, 82, 84–85, 87, 89–91; portions of Item 92 and Item 93. Revisions to Part III (Electrical Systems) are covered in Part IIIB of this Report.


Explanation of ANSI Status

This Committee activity operates under the aegis of the American National Standards Institute under the joint sponsorship of the Mobile Home Manufacturers Association, the National Fire Protection Association, the Recreational Vehicle Institute, and the Trailer Coach Association with the NFPA acting as the Administrative Secretariat.


Vote Statements

On Part IA, of the 32 voting members of the Sectional Committee, 27 members have voted affirmatively, 1 has voted negatively (Mr. Smithman), 1 has asked to be recorded as not voting (Mr. Palmer) and 3 ballots have not been returned to the date of this report. Mr. Smithman has voted negatively in the belief that further correlation is needed on utility connection locations with the Sectional Committee on Mobile Homes.

On Part IB, concerning the electrical provisions of the Standard, of the 32 voting members, 21 have voted affirmatively, 0 negatively, 4 wished to be recorded as not voting, and 7 ballots have not been returned to date.


On Part IIA, of the 43 voting members of the Sectional Committee, 32 members have voted affirmatively, 6 negatively, and 5 ballots have not been returned up to the date of this report. Those voting negatively are Messrs. Cummings, Dell, Gross, Latter, Smithman, and Van Zandt. Messrs. Cummings, Dell, Gross, Latter, and Van Zandt object to Item 59 in the Report (and related Items 33, 57, and 64c.). Mr. Cummings also objects to Item 26. Mr. Gross also objects to the absence of a mechanism to determine the adequacy of cooling requirements and inadequacies regarding the proposed criteria on solid fuel-burning fireplaces and fireplace stoves. Mr. Smithman votes negatively on Item 26 but his objections are not as yet clearly understood.

On Part IIB of the Report, concerning the electrical provisions of the Standard, of the 43 voting members of the Sectional Committee, 24 have voted affirmatively, 1 negatively (Mr. Smith), 5 wished to be recorded as not voting, and 13 ballots have not been returned to date. Mr. Smith's negative vote concerns objections to Paragraphs 3.11(b), 4.3 and 4.4 and 9.4.3. The objections to 3.11(b), 4.3 and 4.4 would be altered if affirmatively correlated with Code-Making Panel No. 19 of the National Electrical Code Committee. The objection to 9.4.3 is that it is not identical with Par. 23.4.3 of the present text.


On Part IIIA, of the 36 voting members of the Sectional Committee, 29 have voted affirmatively, 0 negatively, 1 asked to be recorded as not voting (Mr. Palmer), and 6 ballots have not been returned up to the date of this report.

On Part IIIB, concerning the electrical provisions of the Standard, of the 36 voting members of the Sectional Committee, 19 members have voted
EXPLANATION OF REPORT

affirmatively, 2 negatively (Messrs. Ewig and Moses), 3 have asked to be recorded as not voting, and 12 ballots have not been returned up to date of this report. Mr. Ewig would like to add to Paragraph 4.4 a warning sign to be installed in the battery compartment reading:

"Do not disconnect battery while converter is plugged into 110 voltage."

Mr. Moses votes negatively because he believes new material should be added on using the metal frame or chassis of recreational vehicles as a return path to ground for low-voltage fixtures and appliances with appropriate safeguards. He also recommends revisions to Paragraphs 4.4, 4.5.1, 4.5.3, 5.2, and 7.10.7. Mr. Radigan of the Recreational Vehicle Institute serves as an alternate to Mr. R. E. Klingler who has not returned his ballot. Mr. Radigan voted negatively and his negative vote will be included if Mr. Klingler does not respond to the ballot request. Mr. Radigan’s negative vote is because of objections to 4.5.3, 5.2, 6.6, 7.4.1.3, 7.4.1.4, 7.16.3, 7.18.3, 11.1.1 and 12.1.


On Part IV A, of the 32 voting members of the Sectional Committee, 29 have voted affirmatively, 0 negatively, and 3 ballots have not been returned up to the date of this report.

Part IV B, concerning the electrical systems in the Standard for Recreational Vehicle Parks, of the 32 voting members of the Sectional Committee, 22 have voted affirmatively, 0 negatively, 3 have asked to be recorded as not voting, and 7 ballots have not been returned up to the date of this report.

An update of these ballot reports will be given at the meeting. The votes of those Correlating Committee members who serve on one or more of the Sectional Committees are counted in the votes of the Sectional Committee. The following tabulation reports the votes of the Correlating Committee members who do not serve on the Sectional Committee responsible for the referenced Standard:

NFPA No. 501A. Of the 10 eligible members, 5 voted affirmatively, one voted negatively (Mr. Smith), one wishes to be recorded as not voting (Mr. Keplinger), and three ballots have not been returned (Mr. Baker, Mr. Nerem, and Mr. Wanzek).

NFPA No. 501B. Of the 2 eligible members, both voted affirmatively.
NFPA No. 501C. Of the 5 eligible members, 3 voted affirmatively, one wishes to be recorded as not voting (Mr. Keplinger), and one ballot has not been returned (Mr. Wanzek).

NFPA No. 501D. Of the 8 eligible members, 5 voted affirmatively, one wishes to be recorded as not voting (Mr. Keplinger), and two ballots have not been returned (Mr. Baker and Mr. Wanzek).

Electrical Provisions of Nos. 501A, 501B, 501C, 501D. Of the 19 members of the Correlating Committee all voted affirmatively on each, except Mr. Smith voted negatively on NFPA No. 501B.

Committee on Mobile Homes and Recreational Vehicles

Correlating Committee

Lloyd W. Garner, Chairman,
Georgia State Firemen's Association, Inc., 730 Church Street, Decatur, GA 30030

George H. Tryon†, Administrative Secretary,
National Fire Protection Association, 470 Atlantic Ave., Boston, MA 02210

LeRoy V. Abbott, MarketDyne International, Incorporated (Chairman, Sectional Committee on Recreational Vehicle Parks)
Russell R. Bahr, State of California, Department of Housing and Community Development (Chairman, Sectional Committee on Mobile Homes)
Harry L. Baker, State of Oregon, Department of Commerce
Artie O. Barker, Idaho State Electrical Board (rep. National Electrical Code Committee; International Association of Electrical Inspectors)
G. E. Blome, American Association of Retired Persons
Edward J. Dwyer, E. J. Dwyer Company (rep. American Society of Mechanical Engineers)
Tom S. Gable, National Sanitation Foundation

†Nonvoting

Kenneth C. Henke, Jr., State of Iowa, Office of Planning and Programming, National Conference of States on Building Codes and Standards
John D. Hoosey, Foremost Insurance Company (Chairman, Sectional Committee on Mobile Home Parks)
Walter H. Johnson, National LP-Gas Association (Chairman, Sectional Committee on Recreational Vehicles)
Duane E. Keplinger, Federal Housing Administration, U.S. Department of Health, Education and Welfare
Norman Latter, International Assn. of Plumbing & Mechanical Officials
Marvin Nerem, Winnebago Industries Recreational Vehicle Institute
W. J. Smith, Underwriters' Laboratories, Inc.
Homer Staves, Kampgrounds of America
C. P. Van Zandt, Sierra Craft, Trailer Court Association
Vinen Wanzek, Fleetwood Enterprises, Mobile Homes Manufacturers Association
Sectional Committee on Mobile Home Parks

John D. Hosey, Chairman,
Foremost Insurance Company, P.O. Box 2450, Grand Rapids, MI 49501

Francis E. Greenleaf,† Secretary,
Standards Director, Trailer Coach Association, 3855 East LaPalma Ave., Anaheim, CA 92806

Frederick F. Heisel, Minnesota State Dept. of Health (rep. Conference of State Sanitary Engineers)

D. E. Hughes, Southern California Gas Company (rep. American Gas Association)

Walter H. Johnson, National LP-Gas Association

Charles W. Lane, Communities International

Norman Latter, International Association of Plumbing and Mechanical Officials

Richard Mitchell, Land Development, Mobile Homes Manufacturers Association

Samuel J. Morano, American Society of Sanitary Engineering


Dr. Mary S. Pickett, Iowa State University (rep. Illuminating Engineering Society)

M. W. Smithman, National Association of Home Builders

Paul L. Solomon, California Dept. of Housing and Community Development

Ted L. Strasser, Nebraska Mobile Housing Institute, Inc.

Alternates

Ralph A. Brewster, American Insurance Association (Alternate to David Curley)

H. Kent Glenn, Electric Light and Power Group (Alternate to William Earthman)

F. E. Hodgdon, American Gas Association (Alternate to D. E. Hughes)

T. A. Hook, National Association of Home Builders (Alternate to M. W. Smithman)

Nicholas A. LaCourte, American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (Alternate to Jordan Heiman)
Neil MacLean, International Association of Plumbing and Mechanical Officials (Alternate to Norman Latter)

W. G. Martin III, National Electrical Manufacturers Association (Alternate to L. E. Palmer)

W. D. Miller, National Electrical Manufacturers Association (Alternate to L. E. Palmer)

Kenneth D. Rhoton, The Craftsmen’s Guild (Alternate to T. R. Arnold)

Nonvoting Members.

Walter N. Burke, Veterans Administration
Donald Fairman, Federal Housing Administration, U.S. Dept. of Housing & Urban Development
Wilford I. Summers, National Fire Protection Association
George H. Tryon, National Fire Protection Association

Sectional Committee on Mobile Homes

Russell R. Bahr, Chairman,
State of California, Department of Housing and Community Development
1500 Fifth Street, Sacramento, CA 95814

Henry Omson,† Secretary,
Standards Director, Mobile Homes Manufacturers Association
14650 Lee Road, Chantilly, VA 22021

LeRoy V. Abbott, MarketDyne International Incorporated
Charles Ashford, Mobile Homes Manufacturers Association
Harry L. Baker, State of Oregon Department of Commerce
Artie O. Barker, Idaho State Electrical Board (rep. National Electrical Code Committee; International Association of Electrical Inspectors)
Don Barrow, Skyline Corp. (rep. Mobile Homes Manufacturers Association)
Herbert W. Behrend, Lake Forest IL (rep. American Society of Civil Engineers)
C. E. Blome, American Association of Retired Persons
John C. Cerney, Cerney and Ivey Associates, Inc.
Jane Kathryn Conrad, Denver, CO (rep. Mobilehome Life)
Orville H. Cummings, Florida Dept. of Highway Safety and Motor Vehicles
David Curley, Aeona Life and Casualty (rep. American Insurance Association)
William E. Dell, State of Washington, Dept. of Labor and Industries
Edward J. Dwyer, E. J. Dwyer Company (rep. American Society of Mechanical Engineers)

Tom S. Gable, National Sanitation Foundation
Lloyd W. Garner, Georgia State Firemen’s Association, Inc.
Francis E. Greenleaf, Trailer Coach Association
John R. Gore, Jr., Georgia State Fire Marshals Association of North America
Hans R. Grigo, National Safety Council
James G. Gross, National Bureau of Standards, U.S. Department of Commerce
Jordan Helman, Intertherm, Inc. (rep. American Society of Heating, Refrigerating and Air Conditioning Engineers)
Frederick F. Heisei, Minnesota State Dept. of Health (rep. Conference of State Sanitary Engineers)
Kenneth C. Henke, Jr., State of Iowa, Office of Planning and Programming (rep. National Conference of States on Building Codes and Standards)
John D. Hosey, Foremost Insurance Company
Walter H. Johnson, National LP-Gas Association
Aron Kliewer, Fleetwood Enterprises, Inc. (rep. Mobile Homes Manufacturers Association)

†Nonvoting
MOBILE HOMES AND RECREATIONAL VEHICLES

John P. Langmead, Gas Appliance Manufacturers Association
Norman Latter, International Association of Plumbing and Mechanical Officials
Samuel J. Morano, American Society of Sanitary Engineering
Dr. Mary S. Pickett, Iowa State University (rep. Illuminating Engineering Society)

W. J. Smith, Underwriters' Laboratories Inc.
M. W. Smithman, National Association of Home Builders
Harry A. Stuart, Trailer Coach Association
Robert A. Tanner, Utah State Fire Marshal (rep. Fire Marshals Association of North America)
C. P. Van Zandt, Sierra Craft (rep. Trailer Coach Association)
John Wilford, New Jersey Dept. of Environmental Protection
J. Herbert Witte, Gas Vent Institute

Alternates

A. E. Aspengren, Mobile Homes Manufacturers Association (Alternate to Charles Ashford)
Don Belton, Mobile Homes Manufacturers Association (Alternate to Aren Kliewer)
Ralph A. Brewster, American Insurance Association (Alternate to David Curley)
Philip Dykstra, National Safety Council (Alternate to Hans R. Grigo)
Rex George Early, National Conference of States for Building Codes and Standards (Alternate to Kenneth C. Henke, Jr.)
Robert J. Evans, Air Conditioning and Refrigeration Institute (Alternate to Jim Printy)
Howard L. Glaaky, Trailer Coach Association (Alternate to Harry A. Stuart)
H. Kent Glenn, Electric Light and Power Group (Alternate to William Earthman)
Paul H. Hellstedt, Building Officials and Code Administrators International (Alternate to Principal to be appointed by Council of American Building Officials)
John C. Hewitt, State of Washington, Dept. of Labor and Industries (Alternate to William E. Dell)
F. E. Hodgdon, American Gas Association (Alternate to Verne R. Groendal)
T. A. Hook, National Association of Home Builders (Alternate to M. W. Smithman)
Nicholas A. LaCourte, American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (Alternate to Jordan Heiman)
Neill MacLean, International Association of Plumbing and Mechanical Officials (Alternate to Norman Latter)
J. P. Markey, Electric Light and Power Group (Alternate to William Earthman)
W. G. Martin III, National Electrical Manufacturers Association (Alternate to L. E. Palmer)
W. D. Miller, National Electrical Manufacturers Association (Alternate to L. E. Palmer)
Chuck Morton, Mobile Homes Manufacturers Association (Alternate to Don Barrow)
Jiyun Nakajji, Trailer Coach Association (Alternate to C. P. Van Zandt)
James H. Piefert, National Bureau of Standards (Alternate to James G. Gross)
Kenneth D. Rhoton, The Craftmen's Guild (Alternate to R. T. Arnold)
Rene H. Yerke, Underwriters' Laboratories, Inc. (Alternate to W. J. Smith)
Michael Zienman, Trailer Coach Association (Alternate to Francis E. Greenleaf)

Nonvoting Members.

Walter N. Burke, Veterans Administration
Clarence E. Cuyler, Division of Community Management Systems, U.S. Dept. of Health, Education and Welfare
Duane E. Keplinger, Federal Housing Administration, U.S. Dept. of Housing & Urban Development
Denis Temple, Canadian Standards Association
Wilford I. Summers, National Fire Protection Association
George H. Tryon, National Fire Protection Association
Sectional Committee on Recreational Vehicles

Walter H. Johnson, Chairman,
Vice President, Technological Services, National LP-Gas Association
79 West Monroe Street, Chicago, IL 60603

Phillip N. Shrake, Secretary,†
Standards Director, Recreational Vehicle Institute, Inc., 2720 Des Plaines Ave.
Des Plaines, IL 60018

Fred F. Helsel, Minnesota State Dept. of Health (rep. Conference of State Sanitary Engineers)
John D. Hosey, Foremost Insurance Company
R. E. Klingler, Holiday Rambler Corp. (rep. Recreational Vehicle Institute)
John P. Langmead, Gas Appliance Manufacturers Association
Norman Latter, International Association of Plumbing and Mechanical Officials
Samuel J. Morano, American Society of Sanitary Engineering
L. W. Moses, Trailer Coach Association
Marvin Nerem, Winnebago Industries, Inc. (rep. Recreational Vehicle Institute)
L. E. Palmer, Union Insulating Company (rep. National Electrical Manufacturers Association)
Dr. Mary S. Pickett, Iowa State University (rep. Illuminating Engineering Society)
Kenneth D. Rhoton, The Craftsmen's Guild
W. J. Smith, Underwriters' Laboratories, Inc.
Harry A. Stuart, Trailer Coach Association
Robert A. Tanner, Utah State Fire Marshal (rep. Fire Marshals Association of North America)
C. P. Van Zandt, Sierra Craft (rep. Trailer Coach Association)
John Wilford, New Jersey Dept. of Environmental Protection
J. Herbert Witte, Gas Vent Institute

†Nonvoting

Alternates

T. R. Arnold, The Craftsmen's Guild (Alternate to Kenneth D. Rhoton)
Doug Betts, Trailer Coach Association (Alternate to L. W. Moses)
Ralph A. Brewster, American Insurance Association (Alternate to David Curley)
Robert J. Evans, Air Conditioning and Refrigeration Institute (Alternate to Jim Printy)
Howard L. Glasky, Trailer Coach Association (Alternate to Harry A. Stuart)

H. Kent Glenn, Electric Light and Power Group (Alternate to William Earthman)
F. E. Hodgdon, American Gas Association (Alternate to Verne R. Groendal)
Eugene L. Kilbourn, Recreational Vehicle Institute (Alternate to Delavan J. Arnold)
Nicholas A. LaCourte, American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (Alternate to Jordan Heiman)
MOBILE HOMES AND RECREATIONAL VEHICLES

Neil MacLean, International Association of Plumbing and Mechanical Officials (Alternate to Norman Latter)
J. P. Markey, Electric Light and Power Group (Alternate to William Earthman)
W. F. Marshall, Recreational Vehicle Institute (Alternate to Marvin Nerem)
W. G. Martin, III, National Electrical Manufacturers Association (Alternate to L. E. Palmer)

W. D. Miller, National Electrical Manufacturers Association (Alternate to L. E. Palmer)
Jiyun Nakajj, Trailer Coach Association (Alternate to C. P. Van Zandt)
F. M. Radigan, Recreational Vehicle Institute (Alternate to R. E. Klinger)
Rene H. Yerke, Underwriters' Laboratories, Inc. (Alternate to W. J. Smith)

Nonvoting Members.

Robert Buechner, National Recreation & Park Association
Wilford I. Summers, National Fire Protection Association
Denis Temple, Canadian Standards Association
George H. Tryon, National Fire Protection Association

Sectional Committee on Recreational Vehicle Parks

LeRoy V. Abbott, Chairman,
MarketDyne International Incorporated, No. 4 Penn Center Building
Philadelphia, PA 19103

Philip N. Shrake, Secretary†
Standards Director, Recreational Vehicle Institute, Inc.
2720 Des Plaines Avenue, Des Plaines, IL 60018

Artie O. Barker, Idaho State Electrical Board (rep. National Electrical Code Committee; International Association of Electrical Inspectors)
Lowry M. Bell, Jr., Howard Johnson's Motor Lodges
C. E. Blume, American Association of Retired Persons
Francis Bowman, Fruit Belt Electrical Cooperative (rep. National Rural Electric Cooperative Association)
Tom S. Gable, National Sanitation Foundation
Lloyd W. Garner, Georgia State Firemen's Association, Inc.
Howard Glasky, Trailer Coach Association
John R. Gore, Jr., Georgia State Fire Marshal (rep. Fire Marshals Association of North America)

Charles J. Hart, National Electrical Contractors Association
John H. Haas, National Park Service, U.S. Dept. of the Interior
Jordan Helman, Intertherm, Inc. (rep. American Society of Heating, Refrigerating and Air Conditioning Engineers)
Frederick F. Heisel, Minnesota State Dept. of Health (rep. Conference of State Sanitary Engineers)
John D. Hosey, Foremost Insurance Company
Walter H. Johnson, National LP-Gas Association
E. J. Kilbourn, Progressive Dynamics Inc. (rep. Recreational Vehicle Institute)
Wayne Korn, PRF Industries, Inc. (rep. Recreational Vehicle Institute)
Norman Latter, International Association of Plumbing and Mechanical Officials
Samuel J. Morano, American Society of Sanitary Engineering
L. W. Moses, Trailer Coach Association
Marvin Nerem, Winnebago Industries, Inc. (rep. Recreational Vehicle Institute)
Kenneth P. Rhoton, The Craftsmen's Guild
Paul L. Solomon, California Dept. of Housing and Community Development
Homer Staves, Kampgrounds of America
Harry A. Stuart, Trailer Coach Association
Robert A. Tanner, Utah State Fire Marshal
  (rep. Fire Marshals Association of North America)

John Wilford, New Jersey Dept. of Environmental Protection
Rene H. Yerke, Underwriters’ Laboratories, Inc.

Alternates

T. R. Arnold, The Craftsmen’s Guild (Alternate to Kenneth D. Rhoton)
Ralph A. Brewer, American Insurance Association (Alternate to David Curley)
H. Kent Glenn, Electric Light and Power Group (Alternate to William Earthman)
F. E. Hodgdon, American Gas Association
  (Alternate to Verne R. Groendal)
Nicholas A. LaCourte, American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (Alternate to Jordan Heiman)
Nell MacLean, International Association of Plumbing and Mechanical Officials (Alternate to Norman Latter)
W. P. Marshall, Recreational Vehicle Institute (Alternate to Marvin Nerem)
W. J. Smith, Underwriters’ Laboratories, Inc. (Alternate to Rene H. Yerke)

Nonvoting Members

J. F. Bryson, Manitoba Hydro (rep. Canadian Standards Association)
Robert Buechner, National Recreation & Park Association
Willford I. Summers, National Fire Protection Association
George H. Tryon, National Fire Protection Association
1974 Proposed Revision to the Standard for Mobile Home Parks

Revision of NFPA No. 501A — 1973 (Proposed ANSI A177.1 — 1973)

1. Par. 2.17 Revise to read:

2.17 Mobile Home Lot. A designated parcel of land in a mobile home park designed for the accommodation of one mobile home, its accessory buildings or structures, and accessory equipment for the exclusive use of the occupants.

2. Par. 3.1. Substitute for the words “recommendations on” the words “provisions for” in the first sentence and delete the word “suggested” in the second sentence since all the Subparagraphs in the Section now contain mandatory provisions (see also Item 5) for new mobile home parks, the revised text to read:

3.1 General. The material in this Part contains provisions for new mobile home park design and land use where local regulations governing such design and land use are not in effect. The criteria is intended to give minimum guidance which is considered good practice.

3. Par. 3.3. Revise to read:

3.3. Space Utilization. Lot coverage and building separation in a mobile home park for each mobile home and its accessory structures shall be in accordance with the following:

4. Par. 3.3.2. Revise by editorially substituting for the words “mobile homes” the words “a mobile home” to keep the language in the singular, the revised text to read:

3.3.2 A mobile home shall not be located closer than 10 feet from any other mobile home or permanent building within the mobile home park. Mobile home accessory building shall not be closer than 3 feet from a mobile home or building on an adjacent lot.

5. Par. 3.6. Change “should” to “shall,” the revised text to read:

3.6 Vehicle Parking. Mobile home parks shall be designed to include two automobile parking spaces for each mobile home lot.
6. Par. 4.1. Revise to read as follows (see also changes for Par. 7.1.5, 7.2.3.4, 8.4.2 (new) and 9.1.6 in Items 11, 14, 17, and 20, deleting the present "Note" and "Exception" but retaining present 4.1.1).

4.1 Utility Connections. Utility connections serving each mobile home shall be located as specified in Paragraphs 7.1.5 (water), 7.2.3.4 (sewer), 8.4.2 (electrical) and 9.1.6 (gas) to properly service the mobile home when placed on a mobile home stand.

Note: See Figure 2, Appendix A.

7. Par. 5.11.2. Delete the present second sentence and change "should" to "shall" in the last sentence, the revised text to read:

5.11.2 Design and Construction. The design and construction of all structural elements of a porch, stairs leading thereto, and rails shall be in accordance with the applicable provisions of nationally recognized dwelling codes. Live loads applicable to porch floors shall be not less than 40 pounds per square foot.

8. Par. 6.3. Add to the end of the first sentence, the words "adopted by the authority having jurisdiction," the revised wording to read:

6.3 Fuel Gas Piping and Equipment Installations. Fuel gas piping and equipment installations installed within a permanent building in a mobile home park shall comply with nationally recognized appliance and fuel gas piping codes and standards adopted by the authority having jurisdiction. Where the state or other political subdivision does not assume jurisdiction, such fuel gas piping and equipment installations shall be designed and installed in accordance with the appropriate provisions of the Standard for the Installation of Gas Appliances and Gas Piping (NFPA No. 54-1969; ANSI Z21.30-1964); the Standard for the Installation of Gas Piping and Gas Equipment on Industrial Premises and Certain Other Premises (NFPA No. 54A-1969; ANSI Z83.1-1972); or the Standard for the Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1972; ANSI Z106.1-1972).

9. Par. 6.4. Add to the end of the first sentence, the words "adopted by the authority having jurisdiction," the revised wording to read:

6.4 Oil-Burning Equipment and Installation. Oil-burning equipment and installations within a permanent building in a mobile home park shall comply with nationally recognized codes and standards adopted by the authority having jurisdiction. Where the state or other political subdivision does not assume jurisdiction, such oil-burning equipment and installation shall be designed and installed in accordance with the appropriate provisions of the
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10. Par. 7.1.2.4. Add at the end of the present sentence the words "of the authority having jurisdiction," the revised paragraph to read:

7.1.2.4 The treatment of a private water supply shall be in accordance with applicable laws and regulations of the authority having jurisdiction.

11. Par. 7.1.5. Revise to read as follows, eliminating the "Exception" (see also Item 6):

7.1.5 Individual Water-Riser Pipes and Connections. Each mobile home stand shall be provided with a water riser or risers located and arranged to permit attachment in a workmanlike manner to the mobile home utilizing the stand. The water supply connection shall be within 3 feet of a line located 40 feet from the front cross member of the mobile home and to the left of the center-line of the stand. (See Section 4.1.)

Note: See Figure 2, Appendix A.

12. New Par. 7.1.5.3. Insert the following new Paragraph 7.1.5.3 renumbering existing Paragraphs 7.1.5.3 — 7.1.5.5 accordingly with no change in content:

7.1.5.3 When used, heat tapes shall be of the listed type.

13. Par. 7.2.2. Revise to specify that the design for the minimum flow of the sewage collection system be 200 gallons per day per mobile home lot instead of 150 gallons, the revised text to read:

7.2.2 Sewage Collection Lines. All sewage collection lines shall be located in trenches of sufficient depth to be free of breakage from traffic or other movements and shall be separated from the park water supply system at a safe distance. Sewage collection lines shall be at a grade which will insure a velocity of two feet per second when flowing full. The system shall be designed for a minimum flow of 200 gallons per day per mobile home lot.

14. Par. 7.2.3.4. Revise to read as follows, eliminating the "Exception" (see also Item 6):

7.2.3.4 Provision shall be made for sealing the sewage collection inlet when a mobile home does not occupy the lot. Surface drainage shall be diverted away from the inlet. The rim of the inlet shall extend not more than 4 inches above ground elevation. The sewer drain inlet shall be within 3 feet of a line located 43 feet from the
front cross member of the mobile home and to the left of the center line of the stand. (See Section 4.1.)

15. Par. 9.1.3.1. Revise to read:

9.1.3.1 Gas piping shall not be installed underground beneath buildings, mobile home stands, mobile home accessory buildings or structures, or concrete slabs unless installed in an approved gas tight conduit.

16. New Par. 9.1.5. Insert the following new Paragraph 9.1.5 (re-numbering present 9.1.5 — 9.1.7 accordingly):

9.1.5 Lot Shutoff Valve. Each mobile home lot shall have an accessible, listed gas shutoff valve installed. Such valve shall not be located under a mobile home. Whenever the mobile home lot outlet is not in use, the shutoff valve shall be plugged to prevent accidental discharge.

17. New Par. 9.1.6 (old 9.1.5). Revise by adding new material (last sentence), eliminating the present “Note” (see also Item 6):

9.1.6 Connector. Each mobile home utilizing gas shall be connected to the mobile home lot outlet by a listed flexible mobile home connector, 6 feet in length, and of sufficient capacity to supply gas to the connected load. Approved rigid pipe and fittings shall be used between the flexible connector and the mobile home lot gas outlet when the distance between the mobile home lot gas outlet and the mobile home gas service connection exceeds 6 feet. The gas supply connection shall be within 3 feet of a line located 37 feet from the front cross member of the mobile home and within 9 feet to the left of the centerline of the stand, clearly outside the perimeter of the mobile home stand. (See also Sections 4.1 and 9.1.6.)

18. New Par. 10.1.7. Insert the following new text:

10.1.7 Heat Tapes. As noted in 7.1.5.3, heat tapes shall be of the listed type.

19. Par. 10.2.1. Delete the first two sentences as not being pertinent to “mobile home parks” and revise the balance of the Paragraph to read (retaining present “Note”):

10.2.1 Detection Systems in Buildings Open to the Public. Fire detection and alarm systems installed in buildings open to the public shall be installed in accordance with the NFPA Standard on Local Protective Signaling Systems (NFPA No. 72A–1972).
20. Par. 10.2.2 Change the “shoulds” to “shall” in both sentences and change the word “approved” in the second sentence to the word “required,” the revised text to read:

10.2.2 Public Fire Alarm Services. Street fire alarm services for the park, if provided, shall be in accordance with the NFPA Standard for the Installation, Maintenance and Use of Public Fire Service Communications (NFPA No. 73-1973). Where such services are not available, alarm procedures shall be posted in each mobile home and in each public building in the park as required by the local fire department.

21. Par. 10.3 Change the word “should” to “shall” in the second, third and fourth sentences.

22. Par. 10.4.1 Change the word “should” to “shall” and insert the word “listed” before the words “portable fire extinguishers.”

23. Par. 10.4.2 Change the words “an approved” to “a listed” in the first sentence, deleting the asterisk footnote.

24. Par. 10.5.1 Change the word “should” to “shall” in the first sentence and insert a new second sentence to read as indicated below:

10.5.1 Introduction. The purpose of this section is to list fire safety rules and regulations which shall be conspicuously posted in areas by the mobile home park management. Park management shall prepare poster(s) containing the type material detailed in Section 10.5.2 as required by the fire department. The objectives are (1) to inform all those concerned to cooperate by complying with these rules which are deemed desirable for the protection of life and property from fire.

25. Par. 10.5.7 Change the word “should” to “shall” and revise the last sentence to read as shown below:

10.5.7 Rubbish. Owners shall keep the area under and around their units free from an accumulation of rubbish (paper), leaves and brush. Containers have been provided for disposing of rubbish and a collection system maintained. Burning of rubbish, if permitted, shall be done only in approved incinerators.

26. Appendix A Change the heading for Figure 1 herein from “Weather Zone Map of U.S.A.” to “Load Zone Map of U.S.A.”

27. Add new “Figure 2. Diagram of Placement of Utility Connections Serving Each Mobile Home.” (see next page)
Figure 2. Diagram of Placement of Utility Connections Serving Each Mobile Home.
Part IB

Revise Part 8, Mobile Home Park Electrical Systems, to read as follows:

Part 8. Mobile Home Park Electrical Systems

8.1 Application and Scope. This Part applies to electrical distribution systems in mobile home parks. It does not apply to the electrical systems of mobile homes or the feeder assembly used to connect them to the mobile home service equipment. Except as otherwise permitted or required by this Standard, all electrical installations in mobile home parks shall be designed and constructed in accordance with the applicable provisions of the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974).

8.2 Distribution System. The mobile home park secondary electrical distribution system to mobile home lot service equipment shall be single phase 115/230 volts nominal. Where the park service exceeds 240 volts, transformers and secondary distribution panels shall be treated as services.

8.3 Calculated Load

8.3.1 Park electrical wiring systems shall be calculated on the basis of not less than 16,000 watts (at 115/230 volts) per each mobile home service. The demand factors which are set forth in Table 1 are the minimum allowable demand factors which may be used in calculating load on feeders and service. No demand factor shall be allowed for any other load, except as provided herein.

Table 1
Demand Factors for Feeders and Service Entrance Conductors

<table>
<thead>
<tr>
<th>Number of Mobile Homes</th>
<th>Demand Factor (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
</tr>
<tr>
<td>3</td>
<td>44</td>
</tr>
<tr>
<td>4</td>
<td>39</td>
</tr>
<tr>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>6</td>
<td>29</td>
</tr>
<tr>
<td>7–9</td>
<td>28</td>
</tr>
<tr>
<td>10–12</td>
<td>27</td>
</tr>
<tr>
<td>13–15</td>
<td>26</td>
</tr>
<tr>
<td>16–21</td>
<td>25</td>
</tr>
<tr>
<td>22–40</td>
<td>24</td>
</tr>
<tr>
<td>41–60</td>
<td>23</td>
</tr>
<tr>
<td>61 and over</td>
<td>22</td>
</tr>
</tbody>
</table>
8.3.2 The demand factor for a given number of lots shall apply to all lots indicated.

For example: 20 lots calculated at 25 percent of 16,000 watts results in a permissible demand of 4,000 watts per lot or a total of 80,000 watts for 20 lots.

8.3.3 Mobile home lot feeder circuit conductors shall have adequate capacity for the loads supplied, and shall be rated at not less than 100 amperes at 115/230 volts.

8.4 Mobile Home Service Equipment

8.4.1 Mobile home service equipment shall be rated at not less than 100 amperes, and provisions shall be made for connecting a mobile home feeder assembly by a permanent wiring method. Power outlets used as mobile home service equipment shall also be permitted to contain receptacles rated up to 50 amperes with appropriate overcurrent protection. Fifty-ampere receptacles shall conform to Figure 8.4.1.

![Figure 8.4.1](image_url)

**Note:** Complete details on the 50-ampere attachment plug cap configuration can be found in American National Standard C73.17 — 1972.

8.4.2 For cord connected mobile homes, the point of connecting the feeder assembly to the mobile home shall be located not less than 45 feet or more than 65 feet from the front of the mobile home stand and outside of the mobile home stand not more than 2 feet from the left line of the stand.

**Note:** 50 feet represents the optimum location for stands designed for mobile homes 50 feet to 70 feet in length.

8.4.3 Mobile home service equipment shall also be provided with a means for connecting a mobile home accessory building or structure or additional electrical equipment located outside a mobile home by a permanent wiring method.
8.4.4 Additional receptacles may be provided for connection of electrical equipment located outside the mobile home; and all such 120-volt, single-phase, 15- and 20-ampere receptacles shall be protected by approved ground-fault circuit protection for personnel.

Note: See Article 210-22(d) of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).

8.4.5 Electrical equipment installed in a mobile home accessory building or structure shall comply with the applicable provisions of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).
Part II A

1974 Proposed Revisions to the Standard for Mobile Homes

NFPA No. 501B — 1973
ANSI A119.1 — 1974

Part A — General

1. Chapter 2. Definitions Common to All Parts. Insert the definitions of the words “Labeled” and “Listed” (as approved by NFPA) in this Chapter. Delete the definitions of “Labeled” from Part C, Chapter 4 and Part E, Chapter 3. Delete the definitions of “Listed” from Part B, Chapter 4; Part C, Chapter 4; Part D, Chapter 3; and Part E, Chapter 3. (See Items 4, 33, 68, and 105 herein.)

Part B — Body and Frame Design and Construction Requirements

2. Par. 4.1. Revise to read:

4.1. Accepted Engineering Practices. Paragraph 2.1 explains the scope of this Part and Chapter 5 sets forth the General Requirements. The Appendix to this Part provides a Reference Table to Accepted Engineering Practices which is not a part of this Standard but is included for information purposes.

3. New Par. 4.3 (redesignating successive Paragraphs in Chapter 4 accordingly). Insert the following new definition:

4.3. Gross Floor Area. To calculate the gross floor area of any room under the provisions of this Standard, all space, wall to wall, shall be counted, including recess entries and areas under built-in vanities and similar furniture. Where ceiling height is less than that specified in 8.2 of this Part, the floor area under such ceilings shall not be included.

4. Par. 4.7 Move this definition of the word “Listed” to Part A, Chapter 2. (See Item 1.)
§ Par. 4.10. Delete the definition of “Single Station Alarm Device.” (See Item 27.)

§ Par. 4.11. Delete the definition of “Sleeping Area” since it is no longer used in the text. (See Item 27.)

§ Par. 4.12. Delete this definition of “Smoke Detector.” (See Item 27.)

§ Par. 5.3. As an editorial matter, add the parenthetical phrase: “(See paragraphs 5.10 and 6.11.)”

§ Par. 5.5. Make editorial correction substituting “6.4” for “6A” in the third line.

§ 7. Acceptability of Materials. The Appendix to this Part lists a group of Accepted Engineering Practice Standards which may be referred to for guidance. Deviations from the applicable portions of these Standards shall be permitted when they meet the performance requirements specified herein.

§ 11. Pars. 6.3., 6.3.1, 6.3.2 and 6.4: Revise to read:

§ 3. Wind and Snow Loads.

6.3.1 Standard Wind. When a mobile home is not designated Hurricane- and Windstorm-Resistive,” the mobile home shall be designed for the following wind loads:

Horizontal .................. 15 lb/ft² (1 day load duration)
Vertical Upward ............ 9 lb/ft² (1 day load duration)
Vertical Downward ............ (See 6.4, Roof Loads)

6.3.2 Hurricane Wind. When a mobile home is designated Hurricane- and Windstorm-Resistive,” the mobile home shall be designed for the following wind loads:

Horizontal .................. 25 lb/ft² (1 day load duration)
Vertical Upward ............ 15 lb/ft² (1 day load duration)
Vertical Downward ............ (See 6.4, Roof Loads)

§ 4. Roof Loads. Flat, curved and pitched roofs shall be designed to resist the following live loads, applied downward on the horizontal projection:
North Zone . . . . 30 lb/ft² (2 months load duration)
Middle Zone . . . . 20 lb/ft² (7 days load duration)
Hurricane Zone . . . . 30 lb/ft² (1 day load duration)

NOTE: When engineering calculations are performed, allowable unit stresses may be increased as provided in the documents referenced in the Appendix Table to Accepted Engineering Practice Standard consistent with the load durations specified in Paragraphs 6.3 and 6.4 of this Part.

12. Par. 6.5. Change the reference on the fifth line from "6.3.1" to "6.3."

13. Par. 6.5.1 (New Notes) Add to this Paragraph the following two New "Notes":

   NOTE No. 1. The provisions of Paragraphs 6.5.1.1, 6.5.1.2 and 6.5.1.3 of this Section shall be followed except when the tiedown system is designed by a Registered Professional Engineer or Architect.

   NOTE No. 2. The manufacturer is only required to make provision for the connection(s) of tiedown hardware equipment but is not required to provide such equipment.

14. Par. 6.5.1.4. Change the "Note" after this Paragraph to read:

   NOTE: Type 1, Class B, Grade 1, steel strapping 1 1/4 inches wide and 0.035 inch thick, conforming with Federal Specification QQ-S-781-F, is judged to conform with Paragraphs 6.5.1.1 and 6.5.1.4 of this Part.

15. Par. 6.7. Revise to read:

6.7 Interior Walls. Interior walls shall be constructed with structural capacity adequate for the intended purpose and shall be capable of resisting a horizontal load of not less than five pounds per square foot.

16. Par. 6.9. Revise to read:


   (a) Floor assemblies shall be designed in accordance with accepted engineering practice standards to support a minimum uniform live load of 40 lb/ft² plus the dead load of the materials. In addition (but not simultaneously), floors shall be able to support a 200-pound concentrated load on a two-inch diameter disc at the most critical location with a maximum deflection not to exceed one-eighth inch relative to floor framing. Perimeter joists of more than six inches depth shall be stabilized against overturning from superimposed loads as follows: at ends by solid blocking not less than two-inch thickness by full depth of joist, or by connecting to a continuous header not less than two-inch thickness and not
less than the depth of the joist with connecting device; at eight-foot maximum intermediate spacing by solid blocking or by wood cross-bridging of not less than one inch by three inches, metal cross-bridging of equal strength, or by other approved methods.

(b) Wood floors or subfloors in kitchens, bathrooms (including toilet compartments), laundry rooms, water heater compartments, and any other areas subject to excessive moisture shall be moisture resistant or shall be made moisture resistant by sealing or by an overlay of nonabsorbent material applied with water-resistant adhesive.

(c) Carpentry shall not be used under a heat-producing appliance unless the appliance is listed for such use.

17. Par. 6.10. Revise to read:

6.10 Design Load Deflection. When a structural assembly is subjected to total design live loads, the deflection for structural framing members shall not exceed the following:

<table>
<thead>
<tr>
<th>Area</th>
<th>Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>L/240</td>
</tr>
<tr>
<td>Roof and Ceiling</td>
<td>L/180</td>
</tr>
<tr>
<td>Headers, Beams, Girders</td>
<td>L/180 (Vertical Loads Only)</td>
</tr>
</tbody>
</table>

Where L = the clear span between supports or two times the length of a cantilever.

18. Par. 6.11. Revise to read:

6.11 Structural Load Tests. Structural assemblies or subassemblies tested for qualification shall sustain the design dead load (see 6.1) plus the superimposed design live loads (see 6.2) equal to 1.75 times the required live loads for a period of 12 hours without failure, unless otherwise specified herein (see 6.5.1.1). Failure shall be considered rupture, fracture or residual deflection which is greater than the limits set in 6.10 of this Part. An assembly or subassembly to be tested shall be representative of the minimum quality of materials of the group of assemblies or subassemblies as ordinarily manufactured. Each test assembly, component or subassembly shall be identified as to type and quality or grade of material. Structural load tests or other tests based on nationally recognized standards may be approved.

19. Par. 7.3. Revise to read:

7.3 Interior Walls, Partitions, and Ceilings. The interior finish
of habitable rooms and hallways (excluding molding, doors, trim, cabinets and splash panels), enclosures for furnaces and water heaters (including doors) shall be of materials whose flame spread classification shall not exceed 200 when tested by the Standard Method of Test for Surface Burning Characteristics of Building Materials (ANSI A2.5–1970; ASTM E84-70; UL723–1971; NFPA No. 255–1972). A door or doors serving a closet with an opening exceeding 21 square feet shall comply with this requirement.

20. Par. 7.5.4 (Certificate only). Change the fourth, fifth and sixth lines of the Certificate to read:

The living area of this home is designed to maintain comfort heating where the outdoor temperatures are not lower than __°F when the home is equipped with storm windows and not lower than __°F when the home is not equipped with storm windows.

21. Par. 7.6. Move to Part E of the Standard. (See Item 105.)

22. Par. 8.1.1. Add the word “gross” before the words “floor area” in both the third and fourth lines.

23. Par. 8.3.1(c) Add the following new sentence to the existing text:

Where a screen or storm window is required to be removed from this window to permit emergency egress, it shall be readily removable without requiring the use of tools.

24. Par. 8.3.3. Revise to read:

8.3.3 Interior Passage. Interior doors having passage hardware without a privacy lock, or with a privacy lock not engaged, shall open from either side by a single movement of the hardware mechanism in any direction.

25. Par. 8.5.1. Revise to read:

8.5.1 Windows. All windows shall meet the requirements for windows as detailed in the Window Specifications for Utilization in Mobile and Factory Built Housing, (MHMA Spec. No. 1–71–Rev. 1973).

26. Par. 8.5.1.1 (New 8.5.2). Renumber as 8.5.2 and reword as shown below with old Table B-2 changed in number to B-1 and revised as shown herein:
8.5.2 Glazing in hazardous locations shall comply with Table B-1.

### TABLE B-1

**Glazing in the Following Specific Hazardous Locations Shall Meet the Following Requirements**

<table>
<thead>
<tr>
<th>Specific Hazardous Locations</th>
<th>Size of Individual Glazed Area</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glazing in exit and entrance doors</td>
<td>Over 6 sq. ft.</td>
<td>Each glazed area shall pass the requirements of ANSI Standard Z97.1 — 1972 if not protected by a protective grille firmly attached to stiles on each exposed side.</td>
</tr>
<tr>
<td>Glazing in storm doors</td>
<td>Over 2 sq. ft.</td>
<td>Each glazed area shall pass the requirements of ANSI Standard Z97.1 — 1972 if not protected by a protective grille firmly attached to stiles on each exposed side.</td>
</tr>
<tr>
<td>Glazing in sliding exterior doors</td>
<td>All Sizes</td>
<td>Each glazed area shall pass the requirements of ANSI Standard Z97.1 — 1972.</td>
</tr>
<tr>
<td>Glazing in all unframed doors (swinging)</td>
<td>All Sizes</td>
<td>Each glazed area shall be fully tempered glass and pass the requirements of ANSI Standard Z97.1 — 1972.</td>
</tr>
<tr>
<td>Glazing in shower doors and tub enclosures</td>
<td>All Sizes</td>
<td>Each glazed area shall pass the test requirements of ANSI Standard Z97.1 — 1972.</td>
</tr>
<tr>
<td>Other fixed glazed panels located within 12 inches on either side of exit and entrance doors</td>
<td>All Sizes</td>
<td>Each glazed area shall pass the requirements of ANSI Standard Z97.1 — 1972 if not protected by a barrier within 12 inches immediately in front of the glazing, not less than 18 inches in height measured from the floor.</td>
</tr>
</tbody>
</table>

1 Shall be constructed and attached in such a manner so as to prevent human impact from being delivered to glass surface.

2 Annealed glass less than single strength (SS) in thickness shall not be used. If short dimension is larger than 24 inches, annealed glass must be double strength (DS) or thicker.

27. Sec. 9. Revise to read:

### 9. Mobile Home Fire Warning Equipment

9.1 General. At least one listed smoke detector (which may be
a single station alarm device) shall be installed in each mobile home.

Note: A "smoke detector" is a device which detects visible or invisible particles of combustion. A single station alarm device is an assembly incorporating a detector and an alarm sounding device in one unit, operated from a power supply either in the unit or obtained at the point of installation.

Detectors shall operate from an AC, monitored battery, or combination AC/battery power source.

9.2 Smoke Detector Location. Smoke detector(s) shall be located outside of bedrooms, in a hallway or space communicating thereto, on or near the ceiling, and shall be installed in accordance with the manufacturer's instructions. Mobile homes having bedrooms separated by any one or combination of common use areas, such as a kitchen, dining room, living room, or family room (but not a bathroom or utility room) shall have at least two detectors.

9.3 Alarm Sounding Device. Every smoke-detecting device shall cause the operation of an alarm signaling device or devices which shall be clearly audible in all bedrooms with all intervening doors closed.

9.3.1 All alarm sounding devices shall be rated not less than 85 decibels at 10 feet.

9.4 Detector Trouble Signals. Detectors requiring a light source for operation shall have an audible trouble signal on failure of the light source, but such failure shall not cause an alarm. Detectors not requiring a light source for operation shall have either a visible light to indicate operability or an audible trouble signal. Audible trouble signals shall be designed to operate at least every minute for seven consecutive days.

9.5 Testing. The mobile home manufacturer shall provide instructions (supplied by the device manufacturer) for the periodic testing of the detector(s).

28. Appendix to Part B; Old Table B-1. Delete the Table Number revising the heading to read:

Reference Table to Accepted Engineering Practice Standards for Part B of this Standard

This Reference Table is not a part of this Standard but is included for information purposes.
29. Reference Table to Accepted Engineering Practice Standards (see Item 28). Add to and update this Table as indicated below (checking the references again prior to final publication):


b. The reference to USDC CS 253–63 should be changed to USD PS 56–73.

c. The most recent edition of the National Design Specifications for Stress Grade Lumber and its Fastenings is 1973 with a Supplement issued April 1973 (the present Table shows 1971).

d. The latest edition of the Standard for Working Stresses for Joists and Rafters is 1971 with a Supplement issued December 1972 (the present Table shows 1970).

e. The latest edition of the Standard for Particleboard for Mobile Home Decking is NPA 1–73 (present Table shows 1971).


30. Appendix to Part B; Test Procedure for Roof Rafters or Roof Trusses. Revise the first three items under “Test Procedures” to read:

1. Apply load units to the sheathing to equal the full dead load of roof and ceiling.

2. Noting the drawing (B-1), measure and record initial elevation of rafter or truss in test position at dead load.

3. Maintaining the dead load, add live load in 10 lb/ft² increments at 10-minute intervals. Continue until design load is reached and maintain load for 10 minutes. The maximum deflection due to design live load (elevation measured in Step 3 minus Step 2) shall not exceed L/180, when L is the clear span measured in the same units. Duration of load factors for wind or snow loading have been considered in establishing this test method. The test loads used shall be for the appropriate zone, as specified in Section 6.4 of this Part. No reduction shall be made in the test loads for snow and wind conditions.

31. Add a new Appendix to Part B to read as follows:

Wood Product Based Wall Surfacing for Tub and Shower Enclosures

Material: The wall covering material must have an exposed surface that is impervious to water; the substrate
material must be resistant to deterioration from exposure to high humidity and temporary water leakage.

A. Strength:
The complete wall assembly, including the wall covering substrate, shall be capable of withstanding a uniform load of five pounds per square foot applied perpendicular to the surface. The deflection, under load, shall not exceed L/180 of the height of the wall, for the assembly; or L/240 the distance between framing members, for the wall covering substrate.

B. Surface Finish:
The exposed surface must meet the minimum requirements of the American Hardboard Association Industry Standard (I.S. 1-70) Sections 3.4.1 and 3.4.2 Surface Finish Tests for Decorative Finished Interior Wall Paneling: Class 1 as certified by the panel manufacturer.

C. Size:
The minimum thickness of the material shall be 1/8” nominal. The width to be sufficient to give continuous unbroken surface from corner to corner, or end of tub in corner installation. In an installation incorporating a shower, the unbroken surface must continue to a height of at least 6’ above the floor of the shower.

D. Type:
The substrate material shall also meet the requirements of the appropriate standard listed below:

(1) Hardboard: of high strength and water resistance to meet Commercial Standard CS 251–63, Federal Specification LLL-B-810a or AHA I.S. 1-70 either Standard or Tempred

(2) Softwood Plywood: must meet U.S. Product Standard P.S. 1-66 including exterior type glue line and Grade A face veneer “suitable for painting.”

(3) Hardwood Plywood: must meet P.S. 51-75 Type I glue line and sound grade face veneer

(4) Other Materials: not meeting the D-1, D-2, D-3 above, shall meet the requirements of the Standard and their appropriate Product Standard, Industry Standard, Commercial Standard or Federal Specification.

II. Installation:
The material must be installed in conformance with this Standard and the application instructions provided by the material manufacturer. In case of conflict, this Appendix shall take precedence.

A. Framing:
Wood framing shall be spaced not more than 16” on center. Blocking shall be 1” x 3” or equal, installed horizontally at height to match rim of tub or shower pan. All corners shall have sufficient framing members for attachment of corner mouldings.

B. Fastening:
All edges and ends of panel shall occur on framing members. Panels shall be applied to wood framing
members using water resistant, non-hard setting adhesive. Adhesive shall be applied to the face of all framing members except locations where panel edges fall beneath applied mouldings. Panels may also be applied over solid backing using an adhesive. NOTE: Fasteners, if necessary, shall be used only in locations where they will be covered by applied mouldings and shall be used on not more than two adjacent edges. No other interior fasteners, or fixtures, other than required functional plumbing fixtures shall penetrate the face of the panel. Openings for these plumbing fixtures must be sealed with caulk.

C. Corners and Edges: All corners and edges must be caulked or sealed against moisture penetration. A non-hard setting sealant material must be used with applied mouldings. Fastening of mouldings to framing shall not be greater than 6" o.c.

32. Figure B-2. Revise the title on the map to “Load Zone Map of U.S.A.” instead of “Weather Zone Map of U.S.A.”

Part C — Plumbing Systems

33. Part 4 Definitions. Revise or include the following new definitions and move the definitions of Labeled and Listed to Part A (see Item 7).

Anti-Siphon Trap Vent Device. A device which automatically opens to admit air to a fixture drain above the connection of the trap arm so as to prevent siphonage, and closes tightly when the pressure within the drainage system is equal to or greater than atmospheric pressure so as to prevent the escape of gases from the drainage system into the mobile home.

Diameter. Unless otherwise specifically stated, is the nominal (inside) diameter designated commercially.

Grade. The fall (slope) of a pipe in reference to a horizontal plane expressed in inches per foot length.

Individual Vent. A pipe or anti-siphon trap vent device installed to vent a fixture drain.

Main Vent. The principal artery of the venting system to which vent branches may be connected.

Pitch. (See Grade.)

Primary Vent. (See Main Vent)

Secondary Vent. Any vent other than the main vent or those serving each toilet.
Vent Caps. A device or fitting which protects the vent pipe from foreign substance with an opening to the atmosphere equal to the area of the vent it serves.

34. Par. 8.1.9.1. Editorial. In the last line change the word “invert” to the word “weir”.

35. Par. 8.1.9.3. Revise to read:

8.1.9.3 Concealed Traps. Traps with mechanical joints shall be accessible for repair and inspection.

36. Par. 8.1.9.4. Revise to read:

8.1.9.4 Removability of Traps, Etc. Traps shall be designed and installed so the “U” bend is removable without removing the strainers from the fixture. Continuous waste and tail pieces which are permanently attached to the “U” bend shall also be removable without removing the strainer from the fixture.

37. Par. 9.2.1.5. Revise to read:

9.2.1.5 Floor Connection. Toilets shall be securely bolted to an approved flange or other approved fitting which is secured to the floor by means of corrosion-resistant plated screws. The bolts shall be of solid brass or other corrosion-resistant material and shall be not less than $\frac{1}{8}$ inch in diameter. A watertight seal shall be made between the toilet and flange or other approved fitting by use of a gasket or sealing compound. (See also Paragraph 6.9(b) of Part B)

38. Par. 9.2.2. Change the title of the Paragraph from “Shower Stalls” to “Shower Compartments.”

39. Par. 9.2.2.1. Revise to read:

9.2.2.1 Each compartment stall shall be provided with an approved watertight receptor with sides and back extending 1 inch above the finished dam or threshold. In no case shall the depth of a shower receptor be less than 2 inches or more than 9 inches measured from the top of the finished dam or threshold to the top of the drain. The wall area shall be constructed of smooth, non-corrosive, and nonabsorbent waterproof materials to a height not
less than 6 feet above the compartment floor level. Such walls shall form a watertight joint with each other and with the receptor or shower floor. The floor of the compartment shall slope uniformly to the drain at not less than one-fourth nor more than one-half inch per foot. (See also Appendix to Part B.)

40. Par. 9.2.2.2. Revise to read:

9.2.2.2 The joint around the drain connection shall be made watertight by a flange, clamping ring, or other approved listed means.

41. Par. 9.2.2.4. Revise to read:

9.2.2.4 Prefabricated plumbing fixtures shall be approved or listed and shall comply with all applicable requirements relating to such fixtures.

42. Par. 11.2.1. Revise to read:

11.2.1 Water Connection. Each mobile home with a water distribution system shall be equipped with a ¾-inch threaded inlet connection located within the rear half of the length of the mobile home. This connection shall be tagged or marked “Fresh Water Connection” (or “Fresh Water Fill”). A matching cap or plug shall be provided to seal the water inlet when it is not in use, and shall be permanently attached to the mobile home or water supply piping.

43. New Par. 11.2.1.1. Insert new text to read:

11.2.1.1 When a mobile home includes expandable rooms or is composed of two or more units, fittings or connectors designed for such purpose shall be provided to connect any water piping. When not connected, the water piping shall be protected by means of matching caps or plugs.

44. Par. 11.3.1.2. Revise to read:

11.3.1.2 Any temperature relief valve or combined pressure and temperature relief valve installed for this purpose shall have the temperature sensing element immersed in the hottest water within the upper 6 inches of the tank. It shall be set to start relieving at a pressure of 125 psi or the rated working pressure of the tank whichever is lower and at or below a water temperature of 210°F.

45. Par. 11.3.1.3. Revise to read:
11.3.1.3 Relief valves shall be provided with full-sized drains which shall be directed downward and discharge beneath the mobile home. Drain lines shall be of a material listed for hot water distribution and shall drain fully by gravity, shall not be trapped, and shall not have their outlets threaded.

46. Par. 11.3.2 and 11.3.2.1. Delete in entirety as this subject is covered under the referenced Standards for water heaters listed in the Table of Standards for Plumbing System Components in the Appendix to Part C.

47. Par. 11.4.2. Revise to read:

11.4.2 Fittings. Appropriate fittings shall be used for all changes in size and where pipes are joined. The material and design of fittings shall conform to the type of piping used.

48. Par. 11.6.1 Table C3. Editorially renumber Table to be C-1 (correcting reference in the second line of the Paragraph and in the Table heading) and revise table headings and “Notes” editorially to read:

**TABLE C-1**

Minimum Size Tubing and Pipe for Water Distribution Systems

<table>
<thead>
<tr>
<th>Number of Fixtures</th>
<th>Tubing (Nominal)</th>
<th>Pipe Iron Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dia. (Inches)</td>
<td>Outer Dia. (Inches)</td>
</tr>
<tr>
<td>1</td>
<td>⅛*</td>
<td>⅜</td>
</tr>
<tr>
<td>2</td>
<td>⅜</td>
<td>⅜</td>
</tr>
<tr>
<td>3</td>
<td>½</td>
<td>⅝</td>
</tr>
<tr>
<td>4</td>
<td>⅜</td>
<td>⅝</td>
</tr>
<tr>
<td>5 or more</td>
<td>¾</td>
<td>⅞</td>
</tr>
</tbody>
</table>

*6 feet maximum length.

Exceptions to Table: ⅛ inch nominal diameter or ½ inch OD minimum size for clothes washing or dishwashing machines, unless larger size is recommended by the fixture manufacturer.

½ inch nominal diameter or ⅝ inch OD minimum size for flushometer or metering type valves unless otherwise specified in their listing.

No galvanized screw piping shall be less than ½ inch iron pipe size.

49. Par. 11.6.2.2. Revise to read:

11.6.2.2 A water heater, food waste disposal unit, evaporative cooler or ice maker shall not be counted as a water-using fixture when computing pipe sizes.
50. **Par. 12.2.1.** Revise to read:

**12.2.1 Location of Drain.** Each mobile home shall have only one drain outlet which shall terminate in the rear half section.

51. **Par. 12.2.2.** Revise to read:

**12.2.2 Clearance from Drain Outlet.** The drain outlet shall be provided with a minimum clearance of 3 inches in any direction from all parts of the structure or appurtenances and with not less than 18 inches unrestricted clearance directly in front of the drain outlet.

52. **Par. 12.2.3, 12.2.3.1, 12.2.3.2, 12.2.3.3.** Revise by deleting part, renumbering, and revising into 12.2.3 and 12.2.4 as follows:

**12.2.3 Drain Connector.** The drain connector shall not be smaller than the piping to which it is connected and shall be equipped with a watertight cap or plug matching the drain outlet. The cap or plug shall be permanently attached to the mobile home or drain outlet.

**12.2.4 The drain outlet and drain connector shall not be less than 3 inches inside diameter.**

53. **Par. 12.2.4.** Renumber to be 12.2.5.

54. **Par. 12.4.1.** Revise to read:

**12.4.1 Fixture Load.** Except as provided by Paragraphs 13.4.2, drain pipe sizes shall be determined by the type of fixture and the total number connected to each drain.

55. **Par. 12.7** Revise by adding an exception at the beginning of the text to read: "Except for fixture connections on the inlet side of the trap, . . ." with the rest of the text remaining the same.

56. **Par. 13.3.1(c) Revise to read:**

(c) Two or more vented drains when at least one is wet-vented, or 2-inch diameter (minimum), and each drain is separately connected to the main drain.

57. **Par. 13.3.2.** Revise to read:

**13.3.2 Individual Vents.** Unless protected with an anti-siphon trap vent device, each individually vented fixture with a 1½ inch
or smaller trap shall be provided with a vent pipe equivalent in area to a 1\(\frac{1}{2}\)-inch nominal pipe size. The main vent, toilet vent and relief vent, and the continuous vent of wet-vented systems shall have an area equivalent to 1\(\frac{1}{2}\)-inch nominal pipe size.

58. Par. 13.3.5. (Table C-2). Add the word “Maximum” to the heading of Table C-2, the heading to read: “Maximum Distance of Fixture Trap from Vent.”

59. New Par. 13.4, 13.4.1, 13.4.2, and 13.4.3. Insert the following new material renumbering existing Paragraphs as shown in Item 60:

13.4 Anti-Siphon Trap Vent.

13.4.1 Anti-Siphon Trap Vent Devices. Where an anti-siphon trap vent device is used as a secondary vent, it must be installed in accordance with the terms of its listing and shall be accessible. The lowest point of the valve seal when in the normally closed position shall not be less than 6 inches above the fixture tee. The toilet must be vented in accordance with Paragraph 13.3.1. Only anti-siphon trap vent devices which have been approved shall be installed.

13.4.2 Not more than two fixtures individually protected by anti-siphon trap vent devices shall be drained by a common 1\(\frac{1}{2}\)-inch drain.

13.4.3 Three or more fixtures individually protected by anti-siphon trap vent devices shall be drained by a common 2-inch drain.

60. Old Pars. 13.4, 13.4.1, 13.4.2, 13.5, 13.5.1, 13.5.2 and 13.5.3. Renumber respectively as 13.5, 13.5.1, 13.5.2, 13.6, 13.6.1, 13.6.2 and 13.6.3.

61. New Par. 13.6 (Old 13.5.3). Revise to read:

13.6 Vent Caps. Vent caps, if provided, shall be of the removable type (without removing the flashing from the roof) where required to perform the tests under Paragraph 14.2.1 and 14.2.2 or when the vent is used as a clean out.

62. Par. 14.1 Revise to read:

14.1 Water System. All water piping in the water distribution system shall be subjected to a pressure test. The test shall be made by subjecting the system to air or water at 100 psi for 15 minutes without loss of pressure.

63. Table C-1. Delete Table Number and change the heading to read:
APPENDIX TO PART C

Reference Table for Standards on Plumbing System Components

This Reference Table is not a part of this Standard but is included for information purposes.

64. Reference Table for Standards on Plumbing System Components (see Item 63). Add to, delete from, and update as indicated herein and check the referenced documents again just prior to final publication.

a. Under “Ferrous Pipe and Fittings” insert the following:

<table>
<thead>
<tr>
<th>Cast-Iron Soil Piping and Fittings</th>
<th>ANSI A112.5.1—1971; ASTM A74-72</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FS WW-P-401D — 1969</td>
</tr>
</tbody>
</table>


c. Under “Miscellaneous” add the following:

<table>
<thead>
<tr>
<th>Anti-Siphon Trap Vent Device</th>
<th>NSF-24 1972</th>
</tr>
</thead>
</table>


Part D

Heating, Cooling, and Fuel-Burning Systems

65. Par. 2.2. Revise to read:

2.2 Wherever nationally recognized standards and Part D of this Standard differ, the requirements of Part D shall apply.

66. Par. 2.3. Revise to read:

2.3 An Appendix to this Part lists a group of Standards covering heating, cooling and fuel-burning appliances and systems which may be referred to for guidance. Deviations from the applicable portions of these Standards shall be permitted when they meet the performance requirements specified herein.
67. Chapter 3. Definitions. Add the following two new definitions.

**Factory-Built Fireplace** means a hearth, fire chamber and chimney assembly composed of listed factory-built components assembled in accordance with the terms of listing to form a complete fireplace.

**Fireplace Stove** means a chimney connected solid fuel-burning stove having part of its fire chamber open to the room.

68. Chapter 3. Definitions. Move the definition of the word “Listed” to Part A (see Item 1).

69. Par. 4.2.4.1 (Editorial). Delete the Note following this Paragraph as the content of the Note is identical with the last sentence of the Paragraph.

70. Par. 4.2.4.2(b) (Editorial). Insert the word “not” in the last sentence so that the sentence will read: “Construction shall be such that the blow will not be transmitted to the valve.”

71. Par. 4.2.5.1 (Editorial). In the fourth line change the reference to “B.10” of the Standard for the Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1972; ANSI Z106.1-1972) to “221.”

72. Par. 5.1.2.1. Insert the appropriate Standard to cover threaded brass pipe in this Paragraph, the revised text to read:

5.1.2.1 Steel or wrought-iron pipe shall comply with ANSI Standard B36.10-1970 for Wrought-Steel and Wrought-Iron Pipe. Threaded brass pipe in iron pipe sizes may be used. Threaded brass pipe shall comply with Standard Sizes and Specifications for Seamless Red Brass Pipe (ASTM B43-66).

73. Par. 5.1.4. (Table D-2). Change the Table designation in the 5th line of Paragraph 5.1.4 and on the Heading to the Table to “Table D-1” instead of “Table D-2” and change the heading of Part I of the Table to read:

**TABLE D-1**

Maximum Capacity of Different Sizes of Pipe and Tubing in Thousands of Btu's Per Hour of Natural Gas for Gas Pressures of 0.5 Psig or Less and a Maximum Pressure Drop of ½ Inch Water Column.

74. Par. 5.1.10.2. Change the figure “18” to “24” in the third line of the Paragraph so that the gas supply connection shall be “within 24 inches” of the left (road) side instead of “within 18 inches.”
75. Par. 5.1.11. Add to the present text a new sentence as given just below and add to each Certificate the sentence given second below before the words "Before turning on gas":

The connector capacity indicated on this tag shall be equal to or greater than the total Btuh rating of all intended gas appliances.

When connecting to hot outlet, use a listed gas supply connector for mobile homes rated at □ 100,000 Btuh □ 250,000 Btuh or more.

76. Par. 5.1.13. Revise to read:

5.1.13 Appliance Connections. All gas burning appliances shall be connected to the fuel piping. Materials as provided in Paragraph 5.1.2 of this Part or listed appliance connectors shall be used. Listed appliance connectors when used shall not run through walls, floors, ceilings or partitions. Connectors of aluminum shall not be used outdoors.

77. New Par. 5.1.13.1. Add the following new text:

5.1.13.1 Exterior Appliance Connection. A mobile home containing an LPG or combination LP-natural-gas-system may be provided with a gas outlet to supply exterior appliances when installed in accordance with the following:

(a) No portion of the completed installation shall project beyond the wall of the mobile home.

(b) The outlet shall be provided with an approved "quick-disconnect" device, which shall be designed to provide a positive seal on the supply side of the gas system when the appliance is disconnected. A shutoff valve shall be installed immediately upstream of the quick-disconnect device. The complete device shall be provided as part of the original installation.

(c) Protective caps or plugs for the "quick-disconnect" device, when disconnected, shall be permanently attached to the mobile home adjacent to the device.

(d) A tag shall be permanently attached to the outside of the exterior wall of the mobile home as close as possible to the gas supply connection. The tag shall indicate the type of gas and the Btuh capacity of the outlet and shall be legibly inscribed as follows:

THIS OUTLET IS DESIGNED FOR USE WITH GAS PORTABLE APPLIANCES WHOSE TOTAL INPUT DO NOT EXCEED——— BTUH. REPLACE PROTECTIVE COVERING OVER CONNECTOR WHEN NOT IN USE.
78. **New Par. 5.1.14.1. Add the following new text:**

5.1.14.1 A shutoff valve shall be installed in the fuel piping outside of each gas appliance but inside the mobile home structure, upstream of the union or connector in addition to any valve on the appliance. The shutoff valve shall be located within 6 feet of a cooking appliance and within 3 feet of any other appliance. A shutoff valve may serve more than one appliance if located as required above.

79. **Par. 5.1.15. Revise to read:**

5.1.15 **Gas Piping System Openings.** All openings in the gas piping system shall be closed gas-tight with threaded pipe plugs or pipe caps.

80. **Par. 5.1.19.2. Revise to read:**

5.1.19.2 After appliances are connected, the piping system shall be pressurized to not less than 10 inches nor more than 14 inches water column and the appliance connections tested for leakage with soapy water or bubble solution.

81. **Par. 6.1.1. Revise to read:**

6.1.1 **Heat-producing appliances and vents, roof jacks and chimneys necessary for their installation in mobile homes shall be listed or certified by a nationally recognized testing agency for use in mobile homes.** Air conditioning units, combination air-conditioning and heating units shall be listed or certified by a nationally recognized testing agency for the application for which the unit is intended.

82. **New Par. 6.1.4. Add the following new text:**

6.1.4 Gas-fired absorption comfort-cooling units shall meet all the requirements of ANSI Standard Z21.40.1.

83. **New Par. 6.1.5. Add the following new text:**

6.1.5 Mechanical comfort-cooling units shall meet all the requirements of ARI Standard 210–66.

84. **New Par. 6.1.6. Add the following new text:**

6.1.6 Direct refrigerating systems serving any air conditioning or comfort-cooling system installed in a mobile home shall employ a type of refrigerant that ranks no lower than Group 5 in the Under-
writers' Laboratories, Inc. "Classification of Comparative Life Hazard of Various Chemicals."

85. Par. 6.2. Insert the word "Gas" before the present title so that the title will read: "Gas Clothes Dryers."

86. New Par. 6.2.5. Add the following new text:

6.2.5 Gas Clothes Dryer Stub in Requirements. A mobile home may be provided with "stubbed in" equipment at the factory to supply a gas clothes dryer for future installation by the owner provided it complies with the following provisions:

(a) The "stubbed in" gas outlet shall be provided with a shutoff valve, the outlet of which is closed by threaded pipe plug or cap.

(b) The "stubbed in" gas outlet shall be permanently labeled to identify it for use only as the supply connection for a gas clothes dryer.

(c) A moisture lint exhaust duct system shall be roughed in by the manufacturer at the time of original installation. The moisture lint exhaust system shall comply with provisions of Sections 6.2.1 through 6.2.4 of this Part.

87. Par. 6.3.2. Revise first sentence in this text to read (the remainder of the Paragraph and Subparagraphs to remain the same):

6.3.2 All fuel-burning appliances, except ranges, ovens, illuminating appliances, clothes dryers, solid fuel-burning fireplaces and solid fuel-burning fireplace stoves, shall be installed to provide for the complete separation of the combustion system from the interior atmosphere of the mobile home.

88. New Par. 6.3.3.3. Add the following new text:

6.3.3.3 Cooling coils installed as a portion of, or in connection with, any forced-air furnace shall be installed on the downstream side unless the furnace is specifically otherwise listed.

89. New Par. 6.3.3.4. Add the following new text:

6.3.3.4 A cooling coil shall not be located in the air discharge duct or plenum of any forced-air furnace unless such furnace is listed for use with a cooling coil or listed for operation at not less than 0.5 inch water column external static pressure.

90. New Par. 6.3.3.5 Add the following new text:
6.3.3.5 If a cooling coil is installed within a forced-air furnace, the coil shall be listed for use with that furnace in the manner so installed or be approved for such use.

91. New Par. 6.3.4. Add the following new text:

6.3.4 Vertical Clearance Above Gas Cooking Top. Gas ranges shall have a vertical clearance above the cooking top of not less than 30 inches to combustible material or metal cabinets except the clearance may be reduced to not less than 24 inches as follows:

6.3.4.1 The underside of the combustible material or metal cabinet above the cooking top is protected with asbestos millboard at least 1/4-inch thick covered with sheet metal not lighter than No. 28 manufacturer's standard gage, or,

6.3.4.2 A metal ventilating hood of not lighter than No. 28 manufacturer's standard gage sheet metal is installed above the cooking top with a clearance of not less than 1/4 inch between the hood and the underside of the combustible material or metal cabinet and the hood is at least as wide as the range is and is centered over the range.

92. New Pars. 6.3.5 and 6.3.5.1. Add the following new text:

6.3.5 Solid fuel-burning factory-built fireplaces and fireplace stoves listed for use in mobile homes may be installed in mobile homes provided they and their installation conform to 6.3.5.1. A fireplace or fireplace stove shall not be considered as a heating facility for determining compliance with Paragraph 7.5 of Part B.

6.3.5.1 A solid fuel-burning fireplace or fireplace stove shall be equipped with integral door(s) or shutter(s) designed to close the fireplace or fireplace stove fire chamber opening and shall include complete means for venting through the roof, a combustion air inlet, a hearth extension, and means to securely attach the fireplace or the fireplace stove to the mobile home structure. The installation shall conform to the following paragraphs (a) to (h) inclusive:

(a) A listed factory-built chimney designed to be attached directly to the fireplace or fireplace stove shall be used. The chimney or the flue gas outlet of the fireplace or fireplace stove shall not include a damper.

(b) A fireplace or fireplace stove, air intake assembly, hearth extension and the chimney shall be installed in accordance with
the terms of their listings and their manufacturer’s instructions.

(c) The combustion air inlet shall conduct the air directly into the fire chamber and shall be designed to prevent material from the hearth dropping onto the area beneath the mobile home. The air inlet shall not include a damper or other means of closure.

(d) The fireplace or fireplace stove shall not be installed in a sleeping room.

(e) Hearth extension shall be of noncombustible material not less than 3/8-inch thick. The hearth shall extend at least 16 inches in front of and at least 8 inches beyond each side of the fireplace or fireplace stove opening. Furthermore the hearth shall extend over the entire surface beneath a fireplace stove and beneath an elevated or overhanging fireplace.

(f) The label on each solid fuel-burning fireplace and solid fuel-burning fireplace stove shall include the following wording: FOR USE WITH SOLID FUEL ONLY.

(g) The chimney shall be provided with a spark arrester securely attached to the chimney. The net free area of the arrester shall be not less than four times the net area of the chimney outlet and the vertical height of the arrester shall be not less than 1.3 times the diameter of the chimney flue. Openings shall not permit the passage of a sphere having a diameter larger than 1 1/2 inch, nor block the passage of a sphere having a diameter of less than 3/8 inch.

(h) The chimney shall extend at least three feet above the part of the roof through which it passes and at least two feet above the highest elevation of any part of the mobile home within 10 feet of the chimney. Portions of the chimney and termination that exceed an elevation of 13 1/2 ft. above ground level may be designed to be removed for transporting the mobile home.

93. Par. 6.10.1.1. Revise first sentence to read (balance to remain the same except the reference to “Table D-3” should be changed to “Table D-2” (see Item 94)):

6.10.1.1 Supply ducts and any dampers contained therein shall be made from galvanized steel, tin-plated steel, or aluminum, or shall be listed Class O, Class 1, or Class 2 air ducts.

94. Table D-3 of Par. 6.10.1.1. Redesignate as “Table D-2” and draw a line under the words “Diameter or Width” at the top of the Table to separate these three words from the words immediately below same.
95. Table D-4 of Par. 6.10.1.2. Redesignate as "Table D-3" in the title of the Table and on line 5 of the Paragraph.

96. New Par. 6.10.1.4. Insert the following new text:

6.10.1.4 Expandable or Multiple Mobile Home Connections:
(a) An expandable or multiple mobile home may have ducts of the heating system installed in the various units. The points of connection must be so designed and constructed that when the mobile home is fully expanded or coupled, the resulting duct joint will conform to the requirements of this Part.

(b) Installation instructions for supporting the crossover duct from the mobile home shall be provided for onsite installation. The duct shall not be in contact with the ground.

97. New Par. 6.10.1.5. Insert the following new text:

6.10.1.5 Air supply ducts that are not within mobile home insulation having an \( R \) factor of at least 4 shall be insulated.

98. New Par. 6.10.1.6. Insert the following new text:

6.10.1.6 Supply ducts within the mobile home but not within insulation described in 6.10.1.5 shall be insulated with rigid insulation having a thermal insulation (\( R \)) not less than 2.5 or flexible insulation having a thermal insulation (\( R \)) not less than 3 with a continuous vapor barrier having a perm rating of not more than 1.0.

99. New Par. 6.10.1.7. Insert the following new text:

6.10.1.7 Supply ducts exposed directly to outside air, such as under chassis crossover ducts, shall be insulated with material having a thermal insulation (\( R \)) of not less than 4.0 with continuous vapor barrier having a perm rating of not more than 1.0.

100. New Par. 6.10.1.8. Add the following new text:

6.10.1.8 Aluminum foil used as a vapor barrier shall be at least 2 mils in thickness.

101. Par. 6.10.2.2. Revise introductory statement as shown below with no other changes:

6.10.2.2 Duct Material. Return ducts and any diverting dampers contained therein shall be in accordance with the following:
102. Par. 6.10.5. Revise to read:

6.10.5 Registers or Grills. Fittings connecting the registers or grills to the duct system shall be constructed of metal or material which complies with the requirements of Class 1 or 2 ducts under Underwriters' Laboratories, Inc. Standard for Air Ducts, UL181-1972. Registers or grills shall be constructed of metal or conform with the following:

103. Par. 6.10.5.2. Revise to read:

6.10.5.2 Floor register or grills shall resist without structural failure a 200 lb. concentrated load on a 2-inch diameter disc applied to the most critical area of the exposed face of the register or grill. For this test the register or grill is to be at a temperature of not less than 165°F and is to be supported in accordance with the manufacturer's instructions.

104. Table D-1. Delete Table Number, change the heading to read as shown below, and update the referenced documents contained therein.

APPENDIX TO PART D
Reference Table for Standards on Heating, Cooling and Fuel-Burning Appliances, Pipe and Fittings, Systems and Miscellaneous Components

This Reference Table is not a part of the Standard but is included for information purposes.
Part II B

105. Revise Part E — Electrical Systems to read as follows:

Part E — Electrical Systems

1. Scope

1.1 Part E of this Standard and Part A of Article 550 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974) cover the electric conductors and equipment installed within or on mobile homes and the conductors that connect mobile homes to a supply of electricity. The installation of electrical wiring, fixtures, equipment and appurtenances related to electrical installations within a mobile home park up to the mobile home service-entrance conductors, or, if none, the mobile home service equipment are covered in the Standard for Mobile Home Parks (NFPA No. 501A — 1974; ANSI A119.3 — 1974) or in Part B of Article 550 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974). Mobile homes installed in other than mobile home parks shall comply with the provisions of this Part or with Part A of Article 550 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).

1.2 A mobile home not intended as a dwelling unit, as for example, equipped for sleeping purposes only, contractor’s on-site offices, construction job dormitories, mobile studio dressing rooms, bank clinics, mobile stores or intended for the display or demonstration of merchandise or machinery, shall not be required to meet the provisions of this Part pertaining to the number or capacity of circuits required. It shall, however, meet all other applicable requirements of this Part if provided with an electrical installation intended to be energized from a 115-volt or 115/230-volt AC power supply system.

1.3 The provisions of this Part apply to mobile homes intended for connection to a wiring system nominally rated 115/230 volts, 3-wire AC, with grounded neutral.

1.4 In addition to the requirements of this Part and Article 550 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974), the applicable portions of other Articles of the National Electrical Code shall be followed covering electrical installations in mobile homes.

Exception: Wherever the requirements of this Part differ from Articles other than Article 550 of the National Electrical Code, this Part and Article 550 shall apply.
2. Definitions

*Accessible (As Applied to Equipment). Admitting close approach because not guarded by locked doors, elevation, or other effective means. (See "Readily Accessible.")

*Accessible (As Applied to Wiring Methods). Capable of being removed or exposed without damaging the mobile home structure or finish, or not permanently closed-in by the structure or finish of the mobile home (see "Concealed" and "Exposed").

*Air Conditioning or Comfort Cooling Equipment. All of that equipment intended or installed for the purpose of processing the treatment of air so as to control simultaneously its temperature, humidity, cleanliness, and distribution to meet the requirements of the conditioned space.

*Appliance. Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions, such as clothes washing, air conditioning, food mixing, deep frying, etc.

*Appliance, Fixed. An appliance which is fastened or otherwise secured at a specific location.

*Appliance, Portable. An appliance which is actually moved or can easily be moved from one place to another in normal use.

*Appliance, Stationary. An appliance which is not easily moved from one place to another in normal use.

*Attachment Plug (Plug Cap) (Cap). A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

*Bonding. The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

*Branch Circuit. The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

Note: A device not approved for branch circuit protection, such as a thermal cutout or motor overload protective device, is not considered as the overcurrent device protecting the circuit.

*Definition identical to that appearing in the National Electrical Code.
**Branch Circuit — Appliance.** A branch circuit supplying energy to one or more outlets to which appliances are to be connected; such circuits to have no permanently connected lighting fixtures not a part of an appliance.

**Branch Circuit — General Purpose.** A branch circuit that supplies a number of outlets for lighting and appliances.

**Branch Circuit — Individual.** A branch circuit that supplies only one utilization equipment.

**Cabinet.** An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which swinging doors are hung.

**Circuit Breaker.** A device designed to open and close a circuit by nonautomatic means, and to open the circuit automatically on a predetermined overload of current without injury to itself when properly applied within its rating.

**Concealed.** Rendered inaccessible by the structure or finish of the mobile home. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. [See “Accessible (As Applied to Wiring Methods”)]

**Connector, Pressure (Solderless).** A device that establishes a connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder.

**Dead Front (As Applied to Switches, Circuit-Breakers, Switchboards, and Distribution Panelboard).** So designed, constructed, and installed that no current-carrying parts are normally exposed on the front.

**Demand Factor.** The ratio of the maximum demand of a system, or part of a system, to the total connected load of a system or the part of the system under consideration.

**Device.** A unit of an electrical system that is intended to carry but not utilize electrical energy.

**Disconnecting Means.** A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

**Distribution Panelboard.** A single panel or a group of panel units designed for assembly in the form of a single panel, including

*Definition identical to that appearing in the National Electrical Code.*
buses, and with or without switches or automatic overcurrent protective devices or both, for the control of light, heat, or power circuits of small individual as well as aggregate capacity; designed to be placed in a cabinet placed in or against a wall or partition and accessible only from the front.

*Enclosed.* Surrounded by a case that will prevent a person from accidentally contacting live parts.

*Equipment.* A general term, including material, fittings, devices, appliances, fixtures, apparatus, and the like used as a part of, or in connection with, an electrical installation.

*Exposed (As Applied to Live Parts).* Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "Accessible" and "Concealed.")

*Exposed (As Applied to Wiring Method).* On or attached to the surface or behind panels designed to allow access. [See "Accessible (As Applied to Wiring Methods)"]

*Externally Operable.* Capable of being operated without exposing the operator to contact with live parts.

*Feeder Assembly.* The overhead or under-chassis feeder conductors, including the grounding conductor, together with the necessary fittings and equipment, or a power supply cord listed for mobile home use, designed for the purpose of delivering energy from the source of electrical supply to the distribution panelboard within the mobile home.

*Fitting.* An accessory, such as a locknut, bushing, or other part of a wiring system, that is intended primarily to perform a mechanical rather than an electrical function.

*Ground.* A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and earth, or to some conducting body that serves in place of the earth.

*Grounded.* Connected to earth or to some conducting body that serves in place of the earth.

*Grounded Conductor.* A system or circuit conductor that is intentionally grounded.

*Grounding Conductor.* A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

*Definition identical to that appearing in the National Electrical Code.*
*Guarded. Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats or platforms to remove the likelihood of approach or contact by persons or objects to a point of danger.

*Isolated. Not readily accessible to persons unless special means for access are used.

*Lighting Outlet. An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

*Mobile Home Accessory Building or Structure. Any awning, cabana, ramada, storage cabinet, carport, fence, windbreak or porch established for the use of the occupant of the mobile home upon a mobile home lot.

*Mobile Home Lot. A designated parcel of land designed for the accommodation of one mobile home and its accessory buildings, structures, and additional electrical equipment located in a mobile home park or on an individual lot.

Mobile Home Park. A parcel (or contiguous parcels) of land which has been so designated and improved that it contains two or more mobile home lots available to the general public for the placement thereon of mobile homes for occupancy.

*Mobile Home Service Equipment. That equipment containing the disconnecting means, overcurrent protective devices, and receptacles or other means for connecting a mobile home feeder assembly.

Mobile Home Stand. That area of a mobile home lot which has been reserved for the placement of a mobile home.

*Outlet. A point on the wiring system at which current is taken to supply utilization equipment.

Panelboard. A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent protective devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front.

*Definition identical to that appearing in the National Electrical Code.
Raceway. Any channel for holding wires, cables, or busbars that is designed expressly for, and used solely for, this purpose.

*Note:* Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, structural raceways, wireways, and busways.

*Raintight.* So constructed or protected that exposure to a beating rain will not result in the entrance of water.

*Readily Accessible.* Capable of being reached quickly for operation, renewal, or inspection, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "Accessible.")

*Receptacle.* A receptacle is a contact device installed at an outlet for the connection of a single attachment plug.

*Receptacle Outlet.* An outlet where one or more receptacles are installed.

*Utilization Equipment.* Equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar purposes.

*Voltage (of a Circuit).* The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

*Weatherproof.* So constructed or protected that exposure to the weather will not interfere with successful operation.

*Weatherproof.* Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

3. Power Supply

3.1 The mobile home service equipment shall be located adjacent to the mobile home and not mounted in or on the mobile home.

*Definition identical to that appearing in the National Electrical Code.*
The power supply to the mobile home shall be a feeder assembly consisting of not more than 3 mobile home power-supply cords, each rated 50 amperes, or a permanently installed circuit.

Exception: A mobile home that is factory-equipped with gas or oil-fired central heating equipment and cooking appliances may be provided with a mobile home power-supply cord rated 40 amperes.

3.2 If the mobile home has a power-supply cord, it shall be permanently attached to the distribution panelboard or to a junction box permanently connected to the distribution panelboard, with the free end terminating in an attachment plug cap.

3.3 Cords with adapters and pigtail ends, extension cords, and similar items shall not be attached to, or shipped with, a mobile home.

3.4 A suitable clamp or the equivalent shall be provided at the distribution panelboard knockout to afford strain relief for the cord to prevent strain from being transmitted to the terminals when the power-supply cord is handled in its intended manner.

3.5 The cord used shall be of a listed type with four conductors, one of which shall be identified by a continuous green color or a continuous green color with one or more yellow stripes for use as the grounding conductor.

3.6 The attachment plug cap shall be a 3-pole, 4-wire grounding type, rated 50 amperes, 125/250 volts with a configuration as shown in Figure 3.6 and intended for use with the 50-ampere, 125/250 receptacle configuration as also shown in Figure 3.6. It shall be molded of butyl rubber, neoprene, or other approved materials which have been found suitable for the purpose, and shall be molded to the flexible cord so that it adheres tightly to the cord at the point where the cord enters the attachment-plug cap. If a right-angle cap is used, the configuration shall be so oriented that the grounding member is farthest from the cord.

Note: Complete details of the 50-ampere cap and receptacle can be found in the American National Standard Dimensions of Caps, Plugs and Receptacles, Grounding Type, General Purpose, 125/250 volts, 50 amperes, 3-pole, 4-wire (ANSI C73.17 — 1972).

3.7 The overall length of a power-supply cord, measured from the end of the cord, including bared leads, to the face of the attachment-plug cap shall not be less than 21 feet and shall not exceed 36½ feet. The length of cord from the face of the attachment-plug cap to the point where the cord enters the mobile home shall not be less than 20 feet.
3.8 The power-supply cord shall bear the following marking: "For use with mobile homes — 40 amperes" or "For use with mobile homes — 50 amperes."

3.9 The point of entrance of the feeder assembly to the mobile home shall be in the exterior wall, floor, or roof, in the rear third section (away from the coupler) of the mobile home.

3.10 Where a separately metered appliance is installed in the mobile home, or where the calculated load of the mobile home is between 50 amperes and 150 amperes, up to three 50-ampere power-supply cords may be installed when permitted by the authority having jurisdiction, or a feeder assembly as provided for in 3.1 and 3.11 may be installed. The additional power-supply cord(s) shall be located not more than 12 inches away from the point of entrance of the main power-supply cord. They shall not be interconnected on either the line side or the load side, except that the grounding means shall be electrically interconnected.

3.11 Where the calculated load exceeds 150 amperes or where a permanent feeder is used, the supply shall be by means of:

(a) One mast weatherhead installation installed in accordance with Article 230 of the National Electrical Code (ANSI CI — 1974; NFPA No. 70 — 1974) containing four continuous insulated, color-coded, feeder conductors, one of which shall be an equipment grounding conductor; or,

(b) a raceway containing four continuous, insulated, color-coded, feeder conductors, one of which shall be an equipment grounding conductor, running continuously from the mobile home distribution panelboard to the underside of the mobile home. The raceway and conductors shall terminate in a properly-sized junction box. Minimum size of junction boxes shall be (1) 10 in. x 10 in. x 4 in. for feeders rated not more than 100 amperes, and (2) 10 in. x 12 in. x 4 in. for feeders rated not more than 200 amperes.
4. Disconnecting Means and Branch-Circuit Protective Equipment

4.1 The branch-circuit equipment shall be permitted to be combined with the disconnecting means as a single assembly. Such a combination shall be designated as a distribution panelboard. If a fused distribution panelboard is used, the maximum fuse size for the mains shall be plainly marked with lettering at least 1/4-inch high and visible when fuses are changed.

Note: See Section 110-22 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974) concerning identification of each disconnecting means and each service, feeder, or branch circuit at the point where it originated and the type marking needed.

4.2 Plug fuses and fuseholders shall be tamper-resistant, Type "S," enclosed in dead-front fuse panels.

4.3 A disconnecting means shall be provided in each mobile home. For fixed, wiring-type feeder assemblies rated 100 amperes or over, the disconnecting means shall consist of not more than six switches or six circuit breakers mounted in a single enclosure. For one or more power supply cord feeder assemblies or for fixed, wiring-type feeder assemblies rated under 100 amperes, the disconnecting means shall consist of a single switch or circuit breaker for each cord or fixed, wiring-type feeder assembly. The disconnecting means shall be permitted to be mounted in separate enclosures or combined in a single enclosure but without electrical interconnection other than for grounding purposes.

4.4 The disconnecting means shall be installed in a readily accessible location near the point of entrance of the feeder assembly into the mobile home. This equipment shall contain a solderless-type grounding connector or bar for the purposes of grounding, with sufficient terminals for all grounding conductors. The neutral bar termination of the grounded circuit conductors shall be insulated. The disconnecting equipment shall have a rating suitable for the connected load. The distribution equipment, either circuit breaker or fused type, shall be located a minimum of 24 inches from the bottom of such equipment to the floor level of the mobile home. The main circuit breakers or switches shall be plainly marked "Main". There shall be a label attached to the panelboard stating:

```
This Panelboard shall be connected by a Feeder Assembly having Overcurrent Protection rated at not more than ............ Amperes.
```

The correct ampere rating shall be marked in the blank space.
4.5 Where more than one power-supply cord is installed, disconnecting means shall be provided for each cord and it shall be permitted to be in a single equipment but without electrical interconnections other than for grounding purposes.

4.6 A distribution panelboard main circuit breaker shall be rated 50 amperes and employ a 2-pole circuit breaker rated 40 amperes for a 40-ampere supply cord, or 50 amperes for a 50-ampere supply cord. A distribution panelboard employing a disconnect switch and fuses shall be rated 60 amperes and shall employ a single 2-pole, 60-ampere fuseholder with 40- or 50-ampere main fuses for 40- or 50-ampere supply cords, respectively. The outside of the distribution panelboard shall be plainly marked with the fuse size.

4.7 The distribution panelboard shall be permitted inside a closet entry if the location is such that a clear space of 6 inches to easily ignitable materials is maintained in front of the distribution panelboard and the distribution panelboard door can be extended to its full open position (at least 90 degrees). A clear working space at least 30 inches wide and 30 inches in front of the distribution panelboard shall be provided. This space shall extend from floor to the top of the distribution panelboard.

4.8 Branch-circuit distribution equipment shall be installed in each mobile home and shall include overcurrent protection for each branch circuit consisting of either circuit breakers or fuses.

4.9 The branch circuit overcurrent devices shall be rated:

(a) not more than the circuit conductors; and

(b) not more than 150 percent of the rating of a single appliance rated 10 amperes or more which is supplied by an individual branch circuit; but

(c) not more than the fuse size marked on the air conditioner or other motor-operated appliance.

4.10 A 15-ampere multiple receptacle shall be acceptable when connected to a 20-ampere laundry circuit.

4.11 When circuit breakers are provided for branch-circuit protection, 230-volt circuits shall be protected by 2-pole common or companion trip, or handle-tied paired circuit breakers.

4.12 A metal nameplate on the outside adjacent to the feeder assembly entrance shall read:
5. Branch Circuits Required

5.1 The number of branch circuits required shall be determined in accordance with the following:

5.1.1 Lighting. Based on 3 watts per square foot times outside dimensions of the mobile home (coupler excluded) divided by 115 volts to determine number of 15- or 20-ampere lighting area circuits, e.g.,

\[
\frac{3 \times \text{Length} \times \text{Width}}{115 \times 15\text{(or 20)}} = \text{No. of 15\text{(or 20)} ampere circuits}
\]

5.1.2 Portable Appliances. For the small appliance load in kitchen, pantry, family room, dining room and breakfast rooms of mobile homes, two or more 20-ampere appliance branch circuits in addition to the branch circuit specified in Paragraph 5.1.1, shall be provided for all receptacle outlets in these rooms, and such circuits shall have no other outlets. Receptacle outlets supplied by at least two appliance receptacle branch circuits shall be installed in the kitchen.

5.1.3 General Appliances (Including Furnace, Water Heater, Range, and Central or Room Air Conditioner, etc.). There shall be one or more circuits of adequate rating in accordance with the following:

(a) Ampere rating of fixed appliances not over 50 percent of circuit rating if lighting outlets (receptacles, other than kitchen, dining area, and laundry, considered as lighting outlets) are on same circuit;

(b) For fixed appliances on a circuit without lighting outlets the sum of rated amperes shall not exceed the branch-circuit rating for other than motor loads or 80 percent of the branch circuit rating for air conditioning or other motor loads;

(c) The rating of a single portable appliance on a circuit having no other outlets shall not exceed 80 percent of the circuit rating;

(d) The rating of range branch circuit shall be based on the range demand as specified for ranges in 11.1B(5) of this Part.

Note: For central air conditioning, see Article 440 of the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974).
(e) Where laundry facilities are provided in a mobile home, a 20-ampere branch circuit shall be provided within 6 feet of the intended location of the appliance.

Note: See 4.10 of this Part.

6. Receptacle Outlets

6.1 All receptacle outlets shall be:

(a) of grounding type;

(b) installed according to Section 210-7 of the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974); and

(c) except when supplying specific appliances, be parallel-blade, 15-ampere, 125-volt, either single or duplex.

Note: For ground-fault circuit interrupter requirements refer to Section 210-8.(a) of the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974).

6.2 There shall be an individual outlet of the grounding type for each cord-connected fixed appliance installed.

6.3 Receptacle outlets shall be installed where required by Section 210-25(b) of the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974) and in the following additional locations:

(a) adjacent to the refrigerator and adjacent to the free-standing gas-range space.

(b) at counter top spaces for built-in vanities.

(c) at counter top spaces under wall-or ceiling-mounted cabinets.

(d) over or adjacent to bar-type counter tops.

(e) in the wall at the nearest point where a fixed room divider attaches to the wall.

(f) in the wall at the nearest point where a bar-type counter attaches to the wall.

Exception No. 1: Wall space occupied by built-in kitchen and wardrobe cabinets without counter top spaces shall not be included in the 6-foot measurement.

Exception No. 2: Wall space behind doors which may be opened fully against a wall surface.

Exception No. 3: Receptacle outlets shall not be required in fixed room dividers 8 feet long or less of the lattice type attached to a fixed wall, not solid within 6 inches of the floor.
Exception No. 4: Receptacle outlets shall not be required in the wall space afforded by bar-type counters.

6.4 Receptacle outlets shall not be installed within or adjacent to a shower or bathtub space.

7. Fixtures and Appliances

7.1 Electrical materials, devices, appliances, fittings, and other equipment installed, intended for use in, or attached to the mobile home shall be approved for the application and shall be connected in an approved manner when in service. Facilities shall be provided to securely fasten appliances when the mobile home is in transit. (See Section 9 for provisions on grounding.)

7.2 Specifically approved pendant-type fixtures or pendant cords shall be permitted in mobile homes.

7.3 If a lighting fixture is provided over a bathtub or in a shower stall, it shall be of the approved enclosed and gasketed type.

7.4 The switch for shower lighting fixtures and exhaust fans located over a tub or in a shower stall shall be located outside the tub or shower space.

7.5 Any combustible wall or ceiling finish exposed between the edge of a fixture, canopy, or pan and an outlet box shall be covered with noncombustible material.

7.6 Every appliance shall be accessible for inspection, service, repair, or replacement without removal of permanent construction.

8. Wiring Methods and Materials

8.1 Except as specifically limited in this Part, the wiring methods and materials specified in the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974) shall be used in mobile homes.

8.2 Nonmetallic outlet boxes shall be acceptable only with nonmetallic cable.

8.3 Nonmetallic cable located 15 inches or less above the floor, if exposed, shall be protected from physical damage by covering boards, guard strips, or conduit. Cable likely to be damaged by stowage shall be so protected in all cases.

8.4 Metal-clad and nonmetallic cables may be passed through the centers of the wide side of 2-inch by 4-inch studs. However, they
shall be protected where they pass through 2-inch by 2-inch studs or at other studs or frames where the cable or armor would be less than 1\(\frac{1}{2}\) inches from the inside or outside surface. Steel plates on each side of the cable, or a tube, with not less than No. 16 MSG wall thickness shall be required to protect the cable. These plates or tubes shall be securely held in place.

8.5 Where metallic faceplates are used they shall be effectively grounded.

8.6 If the range, clothes dryer, or similar appliance is connected by metal-clad cable or flexible conduit, a length of not less than three feet of free cable or conduit shall be provided to permit moving the appliance. Type NM or Type SE cable shall not be used to connect a range or a dryer. This shall not prohibit the use of Type NM or Type SE cable between the branch circuit overcurrent protective device and a junction box or range or dryer receptacle.

8.7 Threaded rigid metal conduit shall be provided with a locknut inside and outside the box, and a conduit bushing shall be used on the inside. Rigid nonmetallic conduit shall be permitted. Inside ends of the conduit shall be reamed.

8.8 Switches shall be rated as follows:

(a) For lighting circuits, switches shall have a 10-ampere, 120-125 volt rating or higher if needed for the connected lead.

(b) For motors or other loads, switches shall have ampere or horsepower ratings or both adequate for loads controlled. (An “AC general-use” snap switch shall be permitted to control a motor 2 horsepower or less with full-load current not over 80 percent of the switch ampere rating.)

8.9 At least 4 inches of free conductor shall be left at each outlet box except where conductors are intended to loop without joints.

8.10 When outdoor or under-chassis line-voltage wiring is exposed to moisture or physical damage it shall be protected by rigid metal conduit. The conductors shall be suitable for wet locations.

   Exception: Electrical metallic tubing may be used when closely routed against frames and equipment enclosures.

8.11 The cables or conductors shall be Type NMC, TW, or equivalent.

8.12 Outlet boxes of dimensions less than those required in Tables 370-6(a)(1) and 370-6(a)(2) of the National Electrical Code
(NFPA No. 70 — 1974; ANSI Cl — 1974) may be used provided the box has been tested and approved for the purpose.

8.13 Boxes, fittings and cabinets shall be securely fastened in place.

   Exception: Snap-in type boxes or boxes provided with special wall or ceiling brackets that securely fasten boxes in walls or ceilings shall be permitted.

8.14 Outlet boxes shall fit closely to openings in combustible walls and ceilings, and they shall be flush with such surfaces.

8.15 Appliances having branch-circuit terminal connections which operate at temperatures higher than 60°C (140°F) shall have circuit conductors as described in (a) and (b) below:

   (a) Branch-circuit conductors having an insulation suitable for the temperature encountered shall be permitted to run directly to the appliance.

   (b) Conductors having an insulation suitable for the temperature encountered shall be run from the appliance terminal connection to a readily accessible outlet box placed at least one foot from the appliance. These conductors shall be in a suitable raceway which shall extend for at least 4 feet.

9. Grounding

9.1 General. Grounding of both electrical and nonelectrical metal parts in a mobile home shall be through connection to a grounding bus in the mobile home distribution panelboard. The grounding bus shall be grounded through the green-colored conductor in the supply cord or the feeder wiring to the service ground in the service-entrance equipment located adjacent to the mobile home location. Neither the frame of the mobile home nor the frame of any appliance shall be connected to the neutral conductor in the mobile home.

9.2 Insulated Neutral

9.2.1 The grounded circuit conductor (neutral) shall be insulated from the grounding conductors and from equipment enclosures and other grounded parts. The grounded (neutral) circuit terminals in the distribution panelboard and in ranges, clothes dryers, counter-mounted cooking units, and wall-mounted ovens shall be insulated from the equipment enclosure. Bonding screws, straps, or buses in the distribution panelboard or in appliances shall be removed and discarded.
9.2.2 Connection of ranges and clothes dryers with 115/230-volt, 3-wire ratings shall be made with 4-conductor cord and 3-pole, 4-wire grounding-type plugs, or by Type AC metal-clad cable or conductors enclosed in flexible metal conduit. For 115-volt rated devices, a 3-conductor cord and a 2-pole, 3-wire grounding-type plug shall be permitted.

9.3 Equipment Grounding Means

9.3.1 The green-colored grounding wire in the supply cord or permanent feeder wiring shall be connected to the grounding bus in the distribution panelboard or disconnecting means.

9.3.2 In the electrical system, all exposed metal parts, enclosures, frames, lamp fixture canopies, etc., shall be effectively bonded to the grounding terminal or enclosure of the distribution panelboard.

9.3.3 Cord-connected appliances, such as washing machines, clothes dryers, refrigerators, and the electrical system of gas ranges, etc., shall be grounded by means of an approved cord with grounding conductor and grounding-type attachment plug.

9.4 Bonding of Noncurrent-Carrying Metal Parts

9.4.1 All exposed noncurrent-carrying metal parts that may become energized shall be effectively bonded to the grounding terminal or enclosure of the distribution panelboard. A bonding conductor shall be connected between each distribution panelboard and an accessible terminal on the chassis.

9.4.2 Grounding terminals shall be of the solderless type and approved as pressure-terminal connectors recognized for the wire size used. The bonding conductor shall be solid or stranded, insulated or bare, and shall be No. 8 copper minimum, or equal. The bonding conductor shall be routed so as not to be exposed to physical damage.

Note: Protection can be afforded by the configuration of the chassis.

9.4.3 Metallic gas, water and waste pipes and metallic air-circulating ducts shall be considered bonded if they are connected to the terminal on the chassis (see 9.4.1) by clamps, solderless connectors, or by suitable grounding-type straps.

9.4.4 Any metallic roof and exterior covering shall be considered bonded if (a) the metal panels overlap one another and are securely attached to the wood or metal frame parts by metallic fasteners, and (b) if the lower panel of the metallic exterior covering
is secured by metallic fasteners at a cross member of the chassis by two metal straps per mobile home unit or section at opposite ends.

Note: The bonding strap material shall be a minimum of 4 inches in width of material equivalent to the skin or a material of equal or better electrical conductivity. The straps shall be fastened with paint-penetrating fittings (such as screws and starwashers or equivalent).

10. Electrical Testing

10.1 Dielectric Strength Test. The wiring of each mobile home shall be subjected to a 1-minute, 900-volt dielectric strength test (with all switches closed) between live parts (including neutral) and the mobile home ground. Alternatively, the test may be performed at 1,088 volts for 1 second. This test shall be performed after branch circuits are complete and after fixtures or appliances are installed.

Exception: Fixtures or appliances which are listed shall not be required to withstand the dielectric strength test.

11. Calculations

11.1 One of the following two methods shall be employed in computing the supply cord and distribution panelboard load for each feeder assembly for each mobile home:

Method No. 1

A. Lighting and Small Appliance Load

Lighting Watts: Length times width of mobile home (outside dimensions, exclusive of hitch) times 3 watts per square foot; e.g., Length × width × 3 = ..................... lighting watts.

Small Appliance Watts: Number of circuits times 1,500 watts for each 20-ampere appliance receptacle circuit (see definition of "Appliance, Portable" with note); e.g., Number of circuits × 1,500 = ..................... small appliance watts.

Total Watts: Lighting watts plus small appliance = ..................... total watts.

First 3,000 total watts at 100 percent plus remainder at 35 percent = ..................... watts to be divided by 230 volts to obtain current (amperes) per leg.

B. Total load for determining power supply is the summation of:

(1) Lighting and small appliance load as calculated in 11.1A.
(2) Nameplate amperes for motors and heater loads (exhaust fans, air conditioners, electric, gas, or oil heating).†

(3) 25 percent of current of largest motor in (2).

(4) Total of nameplate amperes for: disposal, dishwasher, water heater, clothes dryer, wall-mounted oven, cooking units. Where number of these appliances exceeds three, use 75 percent of total.

(5) Derive amperes for free-standing range (as distinguished from separate ovens and cooking units) by dividing values below by 230 volts.

<table>
<thead>
<tr>
<th>Nameplate Rating</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000 w × or less</td>
<td>80 percent of rating</td>
</tr>
<tr>
<td>10,001-12,500 w</td>
<td>8,000 w</td>
</tr>
<tr>
<td>12,501-13,500 w</td>
<td>8,400 w</td>
</tr>
<tr>
<td>13,501-14,500 w</td>
<td>8,800 w</td>
</tr>
<tr>
<td>14,501-15,500 w</td>
<td>9,200 w</td>
</tr>
<tr>
<td>15,501-16,500 w</td>
<td>9,600 w</td>
</tr>
<tr>
<td>16,501-17,500 w</td>
<td>10,000 w</td>
</tr>
</tbody>
</table>

(6) If outlets or circuits are provided for other than factory-installed appliances include the anticipated load.

NOTE: The following example is given to illustrate the application of this Method of Calculation:

Example

A mobile home is 70 × 10 feet and has two portable appliance circuits, a 1000 watt 230 volt heater, a 200 watt 115 volt exhaust fan, a 400 watt 115 volt dishwasher and a 7000 watt electric range.

Lighting and small appliance load

<table>
<thead>
<tr>
<th>Lighting 70 × 10 × 3 =</th>
<th>2100 watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small appliance 1500 × 2 =</td>
<td>3000 watts</td>
</tr>
<tr>
<td></td>
<td>5100 watts</td>
</tr>
<tr>
<td>1st 3000 watts at 100%</td>
<td>3000</td>
</tr>
<tr>
<td>Remainder (5100 − 3000 = 2100) at 35%</td>
<td>735</td>
</tr>
<tr>
<td></td>
<td>3735</td>
</tr>
</tbody>
</table>

3735
230 = 16 amperes per leg

*Omit smaller of these two, except include blower motor if used as air conditioner evaporator motor.

†When an air conditioner is not installed and a 40-ampere power supply cord is provided, allow 15 amperes per leg for air conditioning.
1000 watt (heater) \div 230 = 4.4 \text{ amp} \\
200 watt (fan) \div 115 = 1.7 \text{ amp} \\
400 watt (dishwasher) \div 115 = 3.5 \text{ amp} \\
7000 watt (range) \times 0.8 \div 230 = 24. \text{ amp}

<table>
<thead>
<tr>
<th>Lighting and appliances</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater (230 volt)</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Fan (115 volt)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Dishwasher (115 volt)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Range</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>46</td>
<td>48</td>
</tr>
</tbody>
</table>

Based on the higher current calculated for either leg, use one 50 ampere supply cord.

**Method No. 2**

**Optional Method of Calculation for Lighting and Appliance Loads.** For mobile homes served by a single 3-wire 115/230-volt set of service-entrance or feeder conductors with an ampacity of 100 or greater, the total load for determining the feeder or service ampacity may be computed in accordance with Table 11.1C instead of the method specified in 11.1A and B. The loads identified in Table 11.1C as “other load” and as “Remainder of other load” shall include the following:

1. 1500 watts for each 2-wire, 20-ampere small appliance branch circuit and each laundry branch circuit specified.
2. 3 watts per square foot for general lighting and general-use receptacles.
3. The nameplate rating of all fixed appliances, ranges, wall-mounted ovens, counter-mounted cooking units, and including 4 or more separately controlled space heating units.
4. The nameplate ampere or kVA rating of all motors and of all low-power-factor loads.
5. The larger of the air-conditioning load or the diversified demand of the heating load when it is unlikely that the two dissimilar loads will be in use simultaneously.

**12. Wiring of Expandable Units and Dual Units**

12.1 Expandable or dual unit mobile homes shall use fixed-type wiring methods and materials for connecting such units to each other.
Table 11.1C
Optional Calculation for Mobile Homes with 100-Ampere or Larger Service

<table>
<thead>
<tr>
<th>Load (in kW or kVA)</th>
<th>Demand Factor (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air conditioning and cooling, including heat pump compressors</td>
<td>100</td>
</tr>
<tr>
<td>Central electric space heating</td>
<td>65</td>
</tr>
<tr>
<td>First 10kW of all other load</td>
<td>100</td>
</tr>
<tr>
<td>Remainder of other load</td>
<td>40</td>
</tr>
</tbody>
</table>

Use the larger of the air-conditioning load or of the electric heating load of (1) air conditioning load; (2) the 65 percent diversified demand of central electric space heating or of less than 4 separately controlled electric space heating units; and (3) the connected load of 4 or more separately-controlled electric space heating units.

12.2 Expandable or dual unit mobile homes not having permanently installed feeder conductors and which are to be moved from one location to another, may have disconnecting means with branch circuit protective equipment in each unit when so located that after assembly or joining together of units the requirements of 3.10 will be met.

13. Outdoor Outlets, Fixtures, Air-Conditioning Equipment, etc.

13.1 Outdoor fixtures and equipments shall be recognized for outdoor use. Outdoor receptacles or convenience outlets shall be of gasketed-cover type.

13.2 A mobile home provided with a receptacle outlet designed to energize heating and/or air conditioning equipment located outside the mobile home, shall have permanently affixed, adjacent to the outlet receptacle, a metal tag which reads:

```
This Connection Is for Air Conditioning Equipment Rated at Not More Than
Amperes, at Volts, 60 Hertz.
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The correct voltage and ampere ratings shall be given. The tag shall be not less than 0.020 inch, etched brass, stainless steel, anodized or alclad aluminum or equivalent. The tag shall be 3 inches by 1¾ inches minimum size.
14. Painting of Wiring

14. During painting or staining of the mobile home, it shall be permitted to paint metal raceways (except where grounding continuity would be reduced) or the sheath of the nonmetallic cable. Some arrangement, however, shall be made so that no paint shall be applied to the individual wires, as the color coding may be obliterated by the paint.

15. Polarization

15.1 The identified (white) conductor shall be employed for grounded circuit conductors only and shall be connected to the identified (white) terminal or lead on receptacle outlets and fixtures. It shall be the unswitched wire in switched circuits, except that a cable containing an identified conductor (white) shall be permitted for single-pole three-way or four-way switch loops where the connections are made so that the unidentified conductor is the return conductor from the switch to the outlet. Painting of the terminal end of the wire shall not be required.

15.2 If the identified (white) conductor of a cable is used for other than grounded conductors or for other than switch loops as explained above (for a 230-volt circuit, for example), the conductor shall be finished in a color other than white at each outlet where the conductors are visible and accessible.

15.3 Green-colored wires or green with yellow stripe shall be used for grounding conductors only.

16. Examination of Equipment for Safety

16.1 The examination or inspection of equipment for safety, according to this Standard, shall be conducted under uniform conditions and by organizations properly equipped and qualified for experimental testing, inspections of the run of goods at factories, and service-value determinations through field examinations.
Appendix to Part E
Standards for Electrical Installations, Wiring and Components

This Reference Table is not a part of this Standard but is included for information purposes.

<table>
<thead>
<tr>
<th>Name of Standard</th>
<th>ANSI</th>
<th>NFPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Electrical Code</td>
<td>Cl — 1974</td>
<td>No. 70 — 1974</td>
</tr>
<tr>
<td>Standard Dimensions of Caps, Plugs, and Receptacles, Grounding Type, General</td>
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</tr>
<tr>
<td>Purpose 125/250 Volts, 50 Amperes, 3 Pole, 4 Wire</td>
<td></td>
<td>(R 1972)</td>
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</table>
Part IIIA

1974 Proposed Revisions to Standard for Recreational Vehicles

NFPA No. 501C — 1972; ANSI A119.2 — 1973

Introductory Chapter. Definitions Common to Parts I - IV

1. Insert the definition of the word "approved" in this Introductory Section, (removing it from Section 3 of Part I, Section 3 of Part II and Section 3 of Part III) to read:

Approved: Means acceptable to the authority having jurisdiction.

2. Revise the definition of "Motor Home" to read:

Motor Home: A vehicular unit designed to provide temporary living quarters for recreational, camping or travel use built on or permanently attached to a self-propelled motor vehicle chassis or on a chassis cab or van which is an integral part of the completed vehicle. (See "Recreational Vehicle.")

3. Revise the definition of "Travel Trailer" to read:

Travel Trailer: A vehicular unit, mounted on wheels, designed to provide temporary living quarters for recreational, camping, or travel use and of such size or weight as not to require special highway movement permits when drawn by a motorized vehicle, and with a living area of less than 220 square feet, excluding built-in equipment (such as wardrobes, closets, cabinets, kitchen units or fixtures) and bath and toilet rooms. (See "Recreational Vehicle.")

4. Revise the definition of "Truck Camper," deleting the definition of "Slide-in Camper" and "Chassis-Mount Camper," to read:

Truck Camper: A portable unit constructed to provide temporary living quarters for recreational, travel, or camping use, consisting of a roof, floor, and sides, designed to be loaded onto and unloaded from the bed of a pick-up truck. (See "Recreational Vehicle.")
Part I Plumbing Systems

5. Section 3. Definitions: Add the following new definition in view of new Par. 12.4 of this Part (see Item 53):

Anti-Siphon Trap Vent Device: A device which automatically opens to admit air to a fixture drain above the connection of the trap arm so as to prevent siphonage and closes tightly when the pressure within the drainage system is equal to or greater than atmospheric pressure so as to prevent the escape of gases from the drainage system into the recreational vehicle.

6. Move the definition of the word “Approved” to the Introductory Section covering “Definitions Common to Parts I, II, and III” with no change in wording (See Item 1.)

7. Delete the definition of the term “Critical Level” since it is no longer used in the Standard.

8. Add the following new definition:

Fullway Valve: A valve, when fully opened, which has a non-fouling passageway not less than the inside diameter of connected piping.

9. Add the following two new definitions:

Manual Disconnect: A joint or connection that can be disassembled without tools.

Readily Accessible: Having direct access without the necessity of removing any panel, door or similar obstruction.

10. Section 3. Definitions: Add the following new definition in view of new Par. 12.4 of this Part (see Item 53):

Primary Vent: The main vent of the vent system which is open to the outside atmosphere.

11. Section 3. Definitions: Add the following new definition in view of new Par. 12.4 of this Part (see Item 53):

Secondary Vent: Any vent other than the primary vent or those serving toilet or holding tank.

12. Delete the definition of “Toilet-Water Flush” since it is no longer used in the Standard.
13. Delete the definition of "Vent Stack" and substitute the following definition:

Vent Systems (Waste): A pipe or pipes installed to provide a flow of air to or from a drainage system to provide a circulation of air within such system to protect trap seals from siphonage and back-pressure.

14. Par. 4.1.4.3. Revise to eliminate unnecessary language; the new text to read:

4.1.4.3 Fittings, connections, devices, or methods of installation that obstruct or retard the flow of liquid waste, body waste, or air in the drainage or venting systems in an amount greater than the normal frictional resistance to flow shall not be used unless their use is acceptable in this Standard or their use approved.

15. Par. 7.1.3.1. Revise to allow running traps for continuous wastes and under shower pans when design will not allow a "P" trap directly under fixture outlet (see Item 23 below) and eliminate the present "Exception" as being unnecessary because integral traps are specifically allowed by the Standard. The revised Paragraph will read:

7.1.3.1 A trap which depends for its seal upon concealed interior partitions shall not be used. Full "S" traps, bell traps, drum traps, and crown-vented traps are prohibited.

16. New Par. 7.1.4.1. Insert the following new text to facilitate service, repair and replacement of traps:

7.1.4.1 Traps and connected tailpieces or continuous waste shall be designed and installed so they can be separated without the removal of the strainer by the use of two or more mechanical joints.

17. Par. 7.1.6 Revise to read as follows since a 1 ¼-inch trap is large enough to service any fixture in a recreational vehicle:

7.1.6 Size. "P" traps shall be not less than one and one-quarter inches (1 ¼") in diameter. A trap shall not be larger than the waste pipe to which it is connected.

18. Par. 7.1.7. Delete and cover subject in new Paragraph 7.1.7.4 (see Item 22).

19. Par. 7.1.8. Delete and cover subject in new Paragraph 7.1.7.5 (see Item 23).
20. Par. 7.1.9, 7.1.9.1, 7.1.9.2. Renumber as Paragraphs 7.1.7, 7.1.7.1, and 7.1.7.2 in view of deletion of old Par. 7.1.7 and 7.1.8 (see Items 18 and 19). In old 7.1.9.1, last sentence, change the word “invert” to “weir.”

21. Par. 7.1.9.3. Renumber as Par. 7.1.7.3 (see Items 18, 19) and revise to indicate need for accessibility of concealed traps, the new text to read:

7.1.7.3. Concealed Traps. Traps shall be accessible for repair and inspection.

22. New Par. 7.1.7.4. Insert the following material in this new Paragraph (see Item 18), moving the content of Table 2 (previously under Paragraph 11.5.3) to this location (see also Item 41):

7.1.7.4 Length of Trap Arm. The distance between a “P” trap and its vent or vented waste line shall be in accordance with the following Table. Not more than one trap shall connect to a trap arm.

<table>
<thead>
<tr>
<th>Size of Trap Arm (Inches)</th>
<th>Distance Trap to Vent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4</td>
<td>4 feet 6 inches</td>
</tr>
<tr>
<td>1 1/2</td>
<td>4 feet 6 inches</td>
</tr>
<tr>
<td>2</td>
<td>5 feet 0 inches</td>
</tr>
<tr>
<td>3</td>
<td>6 feet 0 inches</td>
</tr>
</tbody>
</table>

23. New Par. 7.1.7.5. Insert the following revision of old Par. 7.1.8 (see Item 19) to allow the use of continuous waste drains and running traps where construction design requires such use:

7.1.7.5 Length of Tailpiece. The vertical distance from the fixture outlet to the “P” trap shall not exceed twenty-four inches (24’). The horizontal distance from the fixture’s outlet to the trap shall not exceed thirty inches (30’).

24. Par. 7.2.1.2. Delete. In recreational vehicles the piping length involved and the proposed trap accessibility requirement makes this requirement obsolete (see Item 16).

25. Par. 7.2.1.3. Renumber as 7.2.1.2 (see Item 24).
26. Par. 10.2.3. To allow full use of a flexible showerhead, revise this text to read:

10.2.3 Water Outlets. Unless they are individually protected by a listed backflow preventer or anti-siphon device, the outlets of faucets, spouts, and similar devices shall be spaced at least one inch (1") above the flood level of the fixture.

27. New Par. 10.2.3.1. Insert the following new Paragraph to ensure that the backflow prevention devices are utilized properly:

10.2.3.1 Fixture inlets or valved outlets with hose attachments, which may constitute a cross-connection, shall be protected by a listed backflow prevention device installed at least one inch (1") above the flood level rim of the fixture located on the discharge side of the last valve. Units with an integral backflow preventer shall be installed in accordance with their listing requirements.

28. Par. 10.2.4 Delete text as unnecessary. Par. 4.1.2 requires that fixtures be listed and Par. 5.1 requires that devices conform to approved standards.

29. Par. 10.2.5. Delete text as unnecessary for same reasons as in Item 28.

30. Par. 10.2.6. Revise to incorporate the present “Exception” into the body of the text and renumber as 10.2.4 in view of deletions indicated in Items 28 and 29, the revised text to read:

10.2.4 Backflow Preventer. When pressure water storage tanks or reservoirs (except water heaters) for storing potable water are connected to the water distribution system of recreational vehicles, which have a water service connection for an outside source of supply, they shall have an approved or listed check valve or other approved or listed type backflow prevention device installed in the water-supply piping adjacent to the water service connection. An approved or listed pressure relief valve shall be required on the outlet side of the check valve. Systems utilizing gravity-type tanks or systems not providing means for heating water or creating pressures shall not require a pressure relief valve.

31. Par. 10.3.1 Add a second sentence to the present text to clarify the acceptable use of relief valves in connection with piping materials which are differently rated, the revised complete Paragraph to read:

10.3.1 Every closed water heating system shall be protected against over-temperature and over-pressure by an approved,
listed, and adequately-sized temperature and pressure relief valve. Such valves rated at not more than 125 psi and 210°F shall be acceptable for the protection of systems constructed of materials authorized by Paragraph 10.4.

32. Par. 10.3.2. Eliminate the "note" by the following rewording:

10.3.2 Every storage water heater shall be protected by a relief valve or valves when required by their listing (see Paragraph 6.1 of Part II and the applicable standards listed in the Appendix to Part I and Part II). Listed instantaneous-type water heaters do not require such relief devices.

33. Par. 10.7. Eliminate the "Exception" by incorporating the thought within the text as follows:

10.7 Line Valves. Valves, other than those controlling a single fixture, when installed in the water supply distribution system shall, when fully opened, have a cross-sectional area at least equal to the nominal size of the pipe in which the valve is installed.

34. Par. 11.2.1 Revise to require a single drain for all liquid waste fixtures to ensure a Park hook-up that is consistent with established health and safety standards. For Exception 1, use trailer weight rather than length as a more realistic approach and eliminate any reference to gas and water connections as they are not a factor. Revise Exception 2 as shown. The complete revised text of Par. 11.2 is to read:

11.2.1 Location of Main Drain Outlet. Each recreational vehicle shall have a main drain outlet which shall terminate horizontally if less than eighteen inches (18”) above the ground at any point within twenty-two feet (22’) of the rear, on the left (road) side or at the rear, left of the longitudinal center of the vehicle within eighteen inches (18”) of the outside wall, and shall direct its discharge toward that side or toward the rear within an angle of 90° formed between that side and the rear end of such vehicle. The drain outlet may terminate vertically when it is equipped with a manual disconnect type coupler and a companion elbow hose adapter.

Exceptions:

1. A trailer weighing not more than 1500 pounds Gross Vehicle Weight Rating (GVWR), a motor home or a truck camper may have the drain outlet located on either side, provided the electrical connection is located on the same side.
2. A recreational vehicle having a mechanical seal toilet with waste holding tank or a recirculating chemical toilet may have a separate drain for this waste which may be located at any location on the perimeter of the vehicle within eighteen inches (18") of the outside wall. The drain outlet shall be equipped with a fullway valve conforming to 11.9.3 unless the toilet is equipped with a drain valve designed for manual operation from outside the vehicle with no extension or activating device within the vehicle. The drain for the remainder of the plumbing system shall be considered the main drain.

35. New Pars. 11.2.2, 11.2.2.1 and 11.2.2.2. Insert the following new material specifying minimum drain outlet sizes to assure proper drainage, moving the material on "Caps" to 11.2.3 (see Item 36):

**11.2.2 Size of Drain Outlets.**

11.2.2.1 A drain outlet used for the discharge of body waste shall be three-inch (3") pipe size.

11.2.2.2 A drain outlet used for the discharge of liquid waste shall be one and one-half inch (1 1/2") minimum pipe size.

36. New Par. 11.2.3 revising old Paragraph 11.2.2. This revision is to require a cap on all drain outlets and to permit its attachment to piping as well as to the vehicle. The previous requirement for a tag is thought unnecessary as the existence of the cap should speak for itself. (Present Paragraph 11.2.3 to be renumbered and revised as shown in Item 37.) The new Par. 11.2.3 to read:

11.2.3 Drain Outlet Cap. Each drain outlet shall be equipped with a water-tight cap which shall be permanently attached to the vehicle or drain piping.

37. New Par. 11.2.4 (Revision of old Par. 11.2.3). Revise to clarify intent to read:

11.2.4 Clearance from Drain Outlet. Drain outlets shall be provided with a minimum clearance of one and one-half inches (1 1/2") in any direction from all parts of the vehicle and with clearance directly in front of the outlet to permit connection of a drain hose.

38. Old Pars. 11.2.4, 11.2.4.1, 11.2.4.2 and 11.2.4.3. These requirements deleted as any liquid waste drain outlet is either the main drain or a part of it.
39. Old Pars. 11.2.5 and 11.2.5.1. Revised to clarify that not all drain outlets have hose coupling devices; some are provided with straight pipe for use with a hose clamp. The revised text to read:

11.2.5 Coupling Devices. Where drain outlets are equipped or arranged for hose coupling devices, such devices shall be of the manual disconnect type.

40. Pars. 11.4.1.1 and 11.4.1.2. With plastic drainage piping having smoother interior finishes, fouling is less likely thereby permitting reducing the larger size piping from 2 inches to 1½ inches. One and one-quarter inch (1¼′′) piping is felt to be adequate where three or less fixtures are individually vented. The revised text will read:

11.4.1.1 One and one-quarter inch (1¼′′) minimum diameter piping shall be required for one and not more than three individually vented fixtures.

11.4.1.2 One and one-half (1½′′) minimum diameter piping shall be required for four or more fixtures individually vented.

41. Par. 11.5.3 and Table No. 2. Replaced and incorporated in revised Paragraph 7.1.7.4 (see Item 22 herein).

42. Par. 11.6.1. Clarify to read:

11.6.1 When a recreational vehicle has no plumbing fixture other than a one- or two-compartment sink with drain opening(s) of not more than two inches (2′′) in diameter, that sink may be connected to a side-vent or other approved drainage system.

43. Par. 11.6.2. Remove a portion of the text to avoid redundancy, the revised text to read:

11.6.2 Drainage and vent systems shall be constructed of approved or listed components.

44. Par. 11.6.5. To allow the use of approved side vent devices and to clarify the allowable methods of terminating the drainage piping, this Paragraph is revised to read:

11.6.5 The center of the horizontal vent offset shall be located not less than two and one-quarter inches (2¼′′) above the bottom of the sink, but may terminate through the outside wall at a level lower than the offset. The drain may terminate through the outside wall above the floor or extend vertically through the floor to the exterior.
45. Par. 11.7.3. Revise to read as follows to clarify the need for double entry collector fittings and where single entry fittings may be used, the revised text to read:

11.7.3 Horizontal to Horizontal and Vertical to Horizontal. Horizontal drainage lines connecting with other horizontal drainage lines or vertical drainage lines connected with horizontal drainage lines shall enter through 45-degree “Y” branches, long-turn “TY” branches, or other approved or listed fittings or combination of fittings having equivalent sweep.

11.7.3.1 A single-entry, short-turn “TY” may be used as a final termination if it is mounted directly to the fullway termination valve on one side and has a manual disconnect on the other. A double-entry, short-turn “TY” may be used as a horizontal-to-horizontal drainage fitting provided it is a final termination collector fitting and provided it is approved as a component part of a listed waste valve termination assembly.

46. Par. 11.8. Revise to indicate that a 1/8 inch per foot slope is adequate and eliminate need for full size cleanouts. The revised Paragraph to read:

11.8 Slope of Horizontal Drainage Piping. Horizontal drainage piping, except fixture connections on the inlet side of the trap, shall be run in practical alignment and have a uniform slope of not less than one-eighth inch (1/8”) per foot toward the recreational vehicle main drain outlet.

47. Par. 11.9. Revise to cover separately liquid waste holding tanks and body waste holding tanks, the new text to read:

11.9 Waste Holding Tanks.

11.9.1 Liquid Waste Holding Tank.

11.9.1.1 Minimum size of inlet connections shall be determined by the total number of connected fixtures in accordance with 11.4. The inlet and/or vent fitting shall not extend downward into the tank more than one-half inch (1/2”).

11.9.1.2 Drain opening shall be one and one-half inch (1 1/2”) minimum pipe size located at the lowest point in the tank and shall be connected to a listed fullway valve.

11.9.1.3 The tank shall be vented at the highest point in the top of the tank by one of the following methods:
   a. A one and one-quarter inch (1 1/4”) minimum diameter individual vent pipe extending undiminished in size through the roof.
b. A continuous vent serving as a drain for not more than three fixtures provided the drain portion is increased one pipe size larger than the connected trap arm(s).

11.9.2 Body Waste Holding Tank.

11.9.2.1 Toilet connections shall be three inch (3") minimum pipe size and shall extend vertically. The inlet fitting shall not extend downward into the tank more than one and one-half inches (1½"). The toilet connection shall be designed to receive or conform in an approved shape to a closet flange of standard dimensions or other approved fitting.

11.9.2.2 Drain opening shall be a three inch (3") minimum pipe size outlet located at the lowest point in the tank and shall be connected to a listed fullway valve.

11.9.2.3 The tank shall be vented at the highest point in the top of the tank by one of the following methods:

a. A one and one-quarter inch (1¼") minimum diameter individual vent pipe extending undiminished in size through the roof.

b. A continuous vent serving as a drain from one additional fixture provided the drain portion is increased one pipe size larger than the connected trap arm.

c. Two or more vented drains when at least one is wet-vented and each drain is separately connected to the top of the tank.

48. Par. 11.9.3. Revised to eliminate cross reference which is unnecessary, the revised text to read:

11.9.3 Fullway termination valves shall be designed for manual operation from outside the recreational vehicle and have no extension or activating device within the vehicle.

49. Par. 11.9.4. Deleted. Now incorporated in 11.9.2.3 (see Item 47).

50. Old Par. 11.9.5. (Renumbered 11.9.4 — see Item 49). Revised to clarify intent:

11.9.4 Waste holding tanks shall be securely installed in such locations as to be removable for service, repair, or replacement without the necessity of removing permanent structural members.

51. Par. 11.10, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5 and 11.10.6. By adding the word "listed" before the words "detachable waste
holding tank” in 11.10, the subparagraphs can be deleted. Par. 11.10 will read:

11.10 Detachable Waste Holding System. A recreational vehicle having a sink as its only plumbing fixture may have all its liquid waste discharge into a listed detachable waste holding tank.

52. Par. 12.3.1. Revise to allow the use of the anti-siphon-trap vent device (see Item 53, Par. 12.4) by inserting the cross reference in this text (first phrase), the revised Paragraph to read:

12.3.1 Individual Vents. Unless protected in accordance with Paragraph 12.4, a one and one-quarter inch (1\(\frac{1}{4}\)) minimum diameter vent pipe shall be required for all individually vented fixtures with one and one-half inch (1\(\frac{1}{2}\)) or smaller traps. The continuous vent of wet-vented drainage systems shall be one and one-quarter inch (1\(\frac{1}{4}\)) minimum diameter.

53. New Par. 12.4. Insert the following new Paragraph to cover anti-siphon trap vent devices which tests have proved suitable for this application, renumbering present Paragraphs 12.4, 12.4.1, 12.4.2, 12.5, 12.5.1 (and a new Paragraph thereunder — see Item 55) and 12.5.2 as 12.5, 12.5.1, 12.5.2, 12.6, 12.6.1 (and the new Paragraph as 12.6.1.1) and 12.6.2 respectively. (See Item 55.)

12.4 Anti-Siphon Trap Vent Devices. Where an anti-siphon trap vent device is used as a secondary vent, it must be installed in accordance with the terms of its listing, and the toilet and holding tank must be vented in accordance with Paragraphs 11.9.1.3 or 11.9.2.3. When the main drain by-passes the toilet and/or holding tank there shall be a primary vent. Anti-siphon trap vent devices shall not be used on more than two consecutive fixtures.

54. Par. 12.4.1 Revise to read as follows eliminating last sentence and revising the first:

12.4.1 Horizontal Vents. Each vent shall extend vertically from its fixture “T”, or point of connection with the waste piping, to a point not less than one (1) vent pipe diameter above the extreme flood level of the fixture it is venting before offsetting horizontally or being connected with any other vent pipe. Vents for horizontal drains shall connect above the centerline of the drain piping ahead (downstream) of the trap.

55. New Par. 12.6.1 and 12.6.1.1 (old 12.5 plus new Paragraph). Revise to allow vents to terminate on curved roof structures such as van conversions, the revised text to read:
12.6.1 Roof Extension. Except as otherwise permitted in this Standard each vent pipe shall pass through the roof and terminate vertically, undiminished in size, not less than two inches (2") above the roof. Vents terminating on curved roof areas must pass through the roof at a point as high as practicable.

12.6.1.1 Waste holding tank vent openings shall not be less than three feet (3') away from any motor-driven air intake that opens into habitable areas.

56. Pars. 13.1 and New 13.1.1 and 13.1.2. Revise to read: Incorporate the "Exception" in the body of the text (revised) and insert new paragraphs to read:

13.1 Water Piping System. All pressure water piping in the water distribution system shall be subjected to a pressure test. The test shall be made by subjecting the system to air or water at 100 psi for 10 minutes without leakage or loss of pressure. An adequate and accurate pressure gage shall be used on all tests. All pressure water piping in the water distribution system shall be tested to the maximum setting of the pressure regulator (if provided as standard equipment).

13.1.1 A system pressurized by demand pump only shall be tested at the maximum discharge pressure of the pump.

13.1.2 A recreational vehicle that has no plumbing fixtures other than a sink shall be tested a minimum of 3 minutes.

57. Par. 13.2. Clarify intent of 13.2 by rewording editorially to read: (not revising 13.2.1, 13.2.2 or 13.2.3):

13.2 Drainage and Vent System and Plumbing Fixtures. The waste and vent system shall be subjected to one of the three following tests without evidence of leaks.

58. New Par. 13.3. Insert the following new Paragraph (renumbering present Par. 13.3 as 13.4) to cover the need for a liquid waste system test:

13.3 Liquid Waste System Test. When a recreational vehicle is equipped with a liquid waste holding system, it shall be subjected to a static water test for fifteen (15) minutes by filling the system with water to the level of the lowest connected trap arm.

59. Old Par. 13.3. Renumber as Par. 13.4 with no change (see Item 58).

60. Par. 13.1.1 Delete. This test not required for safety. It will be
tested in accordance with Par. 13.4 (new number) applying to all plumbing fixtures.

61. Table 3 (Standard for Pipe and Fittings). When revising this Table include: ASSE Standard 1001 (Atmospheric Type Vacuum Breakers); ASSE Standard 1002 (Water Closet Ball Cocks); NSF Std. 24 Anti-Siphon Trap Vent Device; ASTM D 2665–1968 (FS L-P-320a), PVC Plastic Drain, Waste and Vent Pipe and Fittings; and IAPMO TSC22–72, Porcelain Enamel Formed Steel Plumbing Fixtures. Place the address of the ASSE in the Footnotes to the Table.

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**Part II — Heating Systems**

62. New Title to Section 4. Revise the title of the Section to read:

4. General Requirements

63. New Par. 4.1. Insert new Par. 4.1 (renumbering existing text — see Item 64) to emphasize needed quality in the design and installation of heating systems as follows:

4.1 Quality of Design and Installation. All design, construction and workmanship shall be in conformance with accepted engineering practices.

64. New Par. 4.2 and 4.2.1 (Old 4.1 and 4.1.2). Renumber as indicated (see Item 63) and require that the vehicle manufacturer supply the LP-gas containers (when needed) to assure their proper sizing and mounting, the revised text to read:

4.2. LP-Gas Containers.

4.2.1 Maximum Capacity. When LP-Gas fuel burning equipment is installed by the recreational vehicle manufacturer, the recreational vehicle shall be provided with:

a. One but not more than two nonpermanently mounted containers having individual water capacities of 105 lbs. maximum (approximately 45 lbs. LP-Gas capacity), or,

b. One but not more than two permanently mounted containers having maximum total water capacity of 478 lbs. (approximately 200 lbs. LP-Gas capacity).
65. Old Par. 4.1.2, 4.1.3, 4.1.3.1, 4.1.3.2 and subparagraph "a" thereof. Renumber as 4.2.2, 4.2.3, 4.2.3.1 and 4.2.3.2 (see Items 63 and 64) with no change in content.

66. Old Par. 4.1.3.2 b (new 4.2.3.2 b). Renumber as required by Items 63–65 and revise to clarify intent as follows:

b. Mounted on the tongue or A frame of a travel or camping trailer not lower than the bottom of the trailer frame.

67. Old Par. 4.1.3.3 Renumber as 4.2.3.3 (see Items 63–66) and revise to assure proper restraint of both containers and container carriers (compartments) and to ensure correct installation by dealers if tongue-mounted containers are removed for shipment, the revised text to read:

4.2.3.3 Container and container carriers shall be secured in place on the recreational vehicle by fastenings designed and constructed to hold each container in place when a load equal to eight (8) times the container's filled weight is applied in any direction. If the recreational vehicle is supplied with the containers not in place, the recreational vehicle manufacturer shall provide mounting instructions with the vehicle.

68. New Par. 4.2.3.4 Insert the following new Paragraph to prevent overheating of LP-Gas containers which could lead to excessive pressures.

4.2.3.4. Containers shall be shielded from the heat if located less than eighteen inches (18") from a vehicle engine's exhaust system.

69. Old Par. 4.1.4, 4.1.4.1 and 4.1.4.2. Renumber as 4.2.4, 4.2.4.1 and 4.2.4.2 (see Items 63–68).

70. Old Par. 4.1.4.3 (New 4.2.4.3). Insert the following new Paragraph to cover where a designated space for additional containers is provided:

4.2.4.3 Container compartments or carriers shall be provided with hold-down fastenings complying with 4.2.3.3 for as many containers as the carriers or compartments are capable of holding.

71. Old Par. 4.1.5, 4.1.5.1 and 4.1.5.2. Renumber as 4.2.5, 4.2.5.1 and 4.2.5.2 (see Items 63–70).

72. Old Par. 4.1.5.3 (New 4.2.3.5). Remove the requirement dealing with connectors to 5.1.13 (see Item 83 herein) and revise to assure proper
installation of an adequately sized, listed regulator, protected against the elements and road spray. The revised wording to read:

4.2.5.3 Listed regulators shall be supplied. Such regulators shall have a capacity not less than the total input of all LP-Gas appliances installed in the recreational vehicle. Provisions shall be made for securely mounting the regulator by attaching it to the container valve, container, supporting standard, or vehicle wall. If the regulator is not mounted by the recreational vehicle manufacturer, instructions for proper installation shall be provided. Regulators shall be installed so the regulator vent opening will not be affected by the elements such as by sleet, snow, freezing rain, ice, mud or by wheel spray.

73. Old Par. 4.1.6, 4.1.6.1 and 4.1.6.2. Renumber as required by actions indicated in Items 63–72 herein to be 4.2.6, 4.2.6.1 and 4.2.6.2.

74. Old Par. 4.1.6.3 (New 4.2.6.3). Revise to clarify intent.

4.2.6.3 Systems installed outside of a recreational vehicle shall be so located that discharge from safety relief devices shall be not less than three feet (3') horizontally away from any openings into the recreational vehicle and from all the internal combustion engine exhaust termination(s) below the level of such discharge. When a system is located in a recess vaportight to the inside, vent openings in such recess shall be not less than three feet (3') horizontally away from any opening into the recreational vehicle below the level of these vents.

Exception: Doors not having openable windows or screens below the level of the gas compartment vents are excepted from this requirement.

75. Pars. 4.1.7 thru 4.2.5. Revise numbering to be 4.2.7 thru 4.3.5 respectively because of the changes indicated in Items 63–74 (no change in Paragraph content).

76. Par. 5.1.2.5. Revise to be identical with the Standard for Mobile Homes while authorizing a reduction in wall thickness of 1/2 inch and smaller steel tubing meeting ASTM A539–69, the revised text to read:

5.1.2.5 Steel tubing shall have a minimum wall thickness of 0.032 inch for tubing of 1/2 inch diameter and smaller and 0.049 inch for diameters over 1/2 inch. Steel tubing shall be constructed in accordance with ASTM Specification for Electric-Resistance Welded Coiled Steel Tubing for Gas and Fuel Oil Lines (ASTM A539–69), and shall be externally corrosion-protected.
77. Par. 5.1.4 (Table 6). With no change in the wording of Par. 5.1.4, revise the Table to read as shown below. This method is considered more accurate and useful than that previously utilized with sizing now determined by BTUH input and length of tubing. It was agreed to place in the Appendix to Part II instructions on the use of the Table which would be similar to that found in NFPA No. 54.

Table 6
Sizing of Low-Pressure Gas Piping Systems

Combination of LP-Gas/Natural Gas System

<table>
<thead>
<tr>
<th>Iron Pipe Sizes</th>
<th>Tubing</th>
<th>Iron Pipe Sizes</th>
<th>Tubing</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D.</td>
<td>Length in Feet</td>
<td>O.D.</td>
<td>Length in Feet</td>
</tr>
<tr>
<td>1/8&quot;</td>
<td>10 20 30 40 50</td>
<td>10 20 30 40 50</td>
<td></td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>40 29 24 20 18</td>
<td>3/8&quot; 27 18 15 13</td>
<td>11</td>
</tr>
<tr>
<td>3/16&quot;</td>
<td>95 65 52 45 40</td>
<td>1/8&quot; 56 38 31 26 23</td>
<td></td>
</tr>
<tr>
<td>1/8&quot;</td>
<td>175 120 97 82</td>
<td>5/32&quot; 113 78 62 53 47</td>
<td></td>
</tr>
<tr>
<td>3/32&quot;</td>
<td>360 250 200 170</td>
<td>1/4&quot; 197 136 109 93 83</td>
<td></td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>680 465 375 320</td>
<td>1/2&quot; 280 193 155 132 117</td>
<td></td>
</tr>
</tbody>
</table>

Expressed in 1000 BTUH

<table>
<thead>
<tr>
<th>LP-Gas Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron Pipe Length in Feet</td>
</tr>
<tr>
<td>I.D. 10 20 30 40 50 O.D. 10 20 30 40 50</td>
</tr>
<tr>
<td>1/8&quot; 67 46 37 31</td>
</tr>
<tr>
<td>3/32&quot; 147 101 81 70</td>
</tr>
<tr>
<td>1/8&quot; 275 189 152 129</td>
</tr>
<tr>
<td>3/32&quot; 567 393 315 267</td>
</tr>
<tr>
<td>1/4&quot; 1071 732 590 504</td>
</tr>
</tbody>
</table>

Expressed in 1000 BTUH

78. Par. 5.16. The chance of leakage at fittings is felt to be reduced by rewording the Paragraph in the following manner:

5.1.6 Tubing Joints. Tubing joints shall be made with a flare of 45° conforming to SAE Standard J 533A as recommended by the tubing manufacturer; by means of listed vibration-resistant fittings; or the joints may be brazed with a material having a melting point exceeding 1000°F. Ball sleeve compression-type tubing fittings shall not be used.

Note: See also Paragraph 5.2.5.
79. Par. 5.1.7. Clarify intent by removing the inference in the existing text that only pipe dope is allowed in making pipe joints, the revised wording to read:

5.1.7 Pipe Joint Material. Threaded joints shall be made-up tight with approved pipe joint material, insoluble in liquefied petroleum gas, and shall be applied to the male threads only.

80. Par. 5.1.10.1. Revise the “Exception” to refer to trailers of 1500 lb. GVWR instead of 17 ft. in length, the revised Exception to read:

Exception: A trailer weighing not more than 1500 lbs. Gross Vehicle Weight Rating (GVWR), a motor home, or a truck camper, may have the gas supply connection located on either side.

81. Par. 5.1.10.2. Eliminate reference to natural gas systems which are not used in recreational vehicles at the time and reword the “Exception” to refer to trailers of 1500 lb. GVWR instead of by length (17 ft.) as previously. The revised wording to read:

5.1.10.2 For combination LP-Gas and natural gas systems, the supply connection shall be located at the containers or within fifteen feet (15') of the rear, on the left (road) side or at the rear, left of the longitudinal center of the vehicle, within eighteen inches (18") of the outside wall.

Exception: A trailer weighing not more than 1500 lbs. Gross Vehicle Weight Rating (GVWR), a motor home, or a truck camper, may have the gas supply connection located on either side.

82. Par. 5.1.12. Revise to assure that the tag is placed by both the LP-Gas containers and the gasoline filler spout and special location provisions are necessary for truck campers because of the uncertainty of the gasoline filler spout location, the revised text to read:

5.1.12 Warning Relative to Motor Fuel and LP-Gas Refueling — Motor Homes, Truck Campers. Each motor home or truck camper having exterior combustion air inlet(s) at a level below the roof shall have a tag which reads:

WARNING: ALL PILOT LIGHTS AND APPLIANCES SHALL BE TURNED OFF DURING REFUELING OF MOTOR FUEL TANKS AND/OR LP-GAS CONTAINERS

On truck campers this tag shall be placed near the front on both the left and right exterior walls. On motor homes and chassis-mount truck campers, this tag shall be by the gasoline filler spout and the LP-Gas container.
83. Par. 5.1.13. Revise the title of this Section editorially to read:

**5.1.13 Gas Supply Connections.**

84. Par. 5.1.13.2 and new Par. 5.1.13.3 and 5.1.13.4 Revise to clarify the allowable LP-Gas connectors to be used as the basis for new connector requirements and to indicate where flexible connectors are required as opposed to where flexing will not be encountered during transit or time of container refueling. The text to read:

**5.1.13.2 LP-Gas Connectors.** Connectors used in LP-Gas systems shall be listed as conforming to Underwriters’ Laboratories, Inc. Standard for Pigtails, Expansion Coils, and Flexible Hose Connectors, UL 569.

**5.1.13.3 High-Pressure LP-Gas Connections.**

a. If the regulator is not directly connected to a permanently mounted container shutoff valve, it shall be connected to the container shutoff valve by a listed high-pressure connector or by material conforming to 5.1.2.

b. The connection between the shutoff valve of a container intended to be removed and mounted on the tongue (A frame) and a regulator mounted on a container support bracket shall be made with a listed high-pressure connector.

c. The connection between the shutoff valve of a container intended to be removed and mounted on the tongue (A frame) and a regulator permanently mounted other than as described in (b) above, shall be made with a listed high-pressure flexible hose connector.

d. The connection between the shutoff valve of a container intended to be removed and mounted within a compartment shall be made with a listed high-pressure flexible hose connector if the regulator is not directly attached to the shutoff valve.

**5.1.13.4 Low-Pressure LP-Gas Connections.**

a. The connection between a permanently mounted regulator or a regulator directly attached to a permanently mounted container and the gas supply system shall be made with a listed connector or with material conforming to 5.1.2.

b. The connection between a regulator mounted on a removable container support bracket or a regulator directly attached to the shutoff valve of a removable container and the gas supply system shall be made with a listed flexible hose connector.

85. Par. 5.1.14 and new 5.1.14.1. Revise to make provision for folding
kitchens in camping trailers and to require listed flexible hose connectors for these kitchen appliances, the revised text to read:

5.1.14 Appliance Connections. Except as provided in 5.1.14.1, all gas-burning appliances shall be connected to the fuel piping with materials as provided in 5.1.2 or with listed appliance connectors which do not pass through any wall, floor, ceiling or partition.

5.1.14.1 Where a flexible connector is required to connect a gas appliance, such as a fold-down range, the connector shall be a listed flexible hose connector.

86. Par. 5.1.15. Revise to limit text to valves (previous text also referred to “appurtenances”) and editorially revise, the revised text to read:

5.1.15 Valves. Shutoff valves used in connection with gas piping shall be listed for use with LP-Gas.

87. Par. 5.1.16 and new Paragraphs 5.1.16.1 and 5.1.16.2. Revise to indicate permanent cap is only necessary on combination systems since LP-Gas systems have no open gas inlets. Add material to prevent entrance of foreign materials during initial shipment into LP-Gas only supply inlets, the revised text to read:

5.1.16 Gas Inlet Cap.

5.1.16.1 For combination LP-Gas and natural gas systems, suitable cap(s) to effectively close the gas inlet(s) when disconnected from the source of supply and not in use shall be attached to the recreational vehicle. Inlets shall be effectively capped when disconnected from source of supply.

5.1.16.2 The LP-Gas only supply inlet shall be effectively capped to prevent entrance of water and foreign materials when the recreational vehicle is shipped with the LP-Gas containers disconnected from the system.

88. Par. 5.1.18. To remove permissiveness from the Standard, revise this Paragraph to read:

5.1.18 Pipe Couplings. Sections of threaded pipe shall be joined by pipe couplings or ground joint unions. Right and left nipples and couplings shall not be used.

89. Par. 5.1.20.1. To allow the use of a bubble type leak detector which is more sensitive than conventional gages when it is used properly, revise this text to read:
5.1.20.1 Before Appliances Are Connected. Piping systems shall be proven by test to be leak free by maintaining an air pressure of at least 6 inches mercury or 3 psig for a period of at least ten (10) minutes. Before the test is begun, temperature of the air and of the piping shall be approximately the same, and a uniform temperature shall be maintained throughout the period. Leaks, if observed, shall be located and corrected. Defective material shall be replaced. Tests shall be conducted by either of the following two methods:

a. Source of air pressure to the piping system shall be shut off. The pressure in the system shall be measured over a period of ten (10) minutes with a mercury manometer, slope gage, or equivalent device, calibrated so as to be read in increments of not greater than one-tenth (1/10) psi. During the ten (10) minute period, a drop in pressure shall not occur.

b. A bubble-type leak detection shall be installed between the source of air pressure and the piping system. After a ten (10) minute equalization period, the bubble detector shall not indicate any air flow for a period of one (1) minute.

90. Par. 5.1.20.2 Revise to allow the use of a bubble-type leak detector, the revised text to read:

5.1.20.2 After Appliances Are Connected. When appliances are connected to the piping system the entire system shall be pressurized to not less than ten inches (10") nor more than fourteen inches (14") water column and the appliance connections tested for leakage with either soapy water, bubble solution, bubble-type leak detector, or other approved means.

91. Par. 5.2.5. Revise to read:

5.2.5 General Specifications for Flared Tubing Joints.
Note: See also Paragraph 5.1.6.

a. After cutting, tubing ends shall be internally reamed prior to flaring. If double flares are used, tubing ends shall also be externally chamfered.

b. Flares shall be square with the axis of the tubing within one-half degree.

c. Flares shall be free from loose scale burrs and cracks. Seating surfaces shall be smooth and free from pit marks.
Section 6. Revise the entire Section 6 to read as follows:

6. Appliances

6.1 General.

6.1.1 Appliances and vents necessary for their installation in recreational vehicles shall be listed or certified by a nationally recognized testing laboratory for this application.

6.1.2 Fuel-burning heat-producing and refrigeration appliances, except ranges, ovens and illuminating appliances, shall be of the vented-type and vented to the outside.

6.1.3 Gas appliances shall be listed or certified for use with LP-Gas only or for use with both natural gas and LP-Gas (convertible from natural gas to LP-Gas and vice versa).

6.1.4 Fuel-burning appliances shall not be converted from one fuel to another unless converted in accordance with the terms of their listings and the appliance manufacturers' instructions.

6.2 Installation of Appliances.

6.2.1 The installation of each appliance shall conform to the terms of its listing and the appliance manufacturer's instructions. The installer shall leave the manufacturer's instructions attached to the appliance. Every appliance shall be secured in place to avoid displacement.

6.2.2 All fuel-burning appliances, except ranges, ovens and illuminating appliances, shall be designed and installed to provide for the complete separation of the combustion system from the interior atmosphere of the recreational vehicle. Combustion air inlets and flue gas outlets shall be listed or certified as components of the appliance. The required separation shall be obtained by the installation of direct vent system (sealed combustion system) appliances.

Note: The requirement for direct vent system appliances as it applies to refrigerators shall be effective as of January 1, 1976.

6.2.3 A forced air heating appliance and its return-air system shall be designed and installed so that negative pressure created by the air-circulating fan cannot affect its or another appliance's combustion air supply or act to mix products of combustion with circulating air.

6.3 Venting, Ventilation and Combustion Air.
6.3.1 Venting and combustion air systems shall be installed in accordance with the following:

a. Components shall be securely assembled and properly aligned using the method shown in the appliance manufacturer's instructions.

b. Vent connectors shall be firmly attached to flue collars by sheet metal screws or by the equivalent.

c. Every joint of a vent, vent connector, exhaust duct and combustion air intake shall be secure and in alignment.

6.3.2 Vents of fuel-burning appliances shall not terminate underneath a recreational vehicle.

6.3.3 Vent terminations shall be not less than three feet (3') from any motor-driven air intake discharging into habitable areas.

6.3.4 When a recreational vehicle is equipped with a gasoline filler spout, combustion air inlets and fuel gas outlets of fuel-burning appliances shall be separated from such spout by at least three feet (3') if they are located above the level of the spout and by at least six feet (6') if they are located below the level of the spout.

6.3.5 The area in which any fuel-burning cooking appliance is located shall be ventilated by a gravity vent opening not less than twelve and one-half square inches (12.5 sq. in.) in cross-sectional area, located higher than the appliance, or, by listed mechanical ventilation equipment that discharges to the outside and is installed in accordance with the terms of its listing and the manufacturer's instructions. Gravity or mechanical ventilation shall be installed within a horizontal distance of not more than ten feet (10') from the vertical front of the appliance. Vent hood ducts shall be designed so that the duct outlet is located at such a point as to preclude the trapping of products of combustion. Ducts shall extend through the wall or roof to the outside.

6.3.6 A permanent warning label with three-eighths-inch high letters shall be affixed in a conspicuous manner adjacent to fuel-burning ranges which shall read:

WARNING: IT IS NOT SAFE TO USE COOKING APPLIANCES FOR COMFORT HEATING.

6.4 Instructions. Operating instructions shall be provided with each appliance.
6.5 Marking.

6.5.1 Information on clearances, input ratings, lighting and shutdown shall be attached to the appliances with the same permanence as the nameplate, and so located that it is easily readable when the appliance is properly installed.

6.5.2 Each fuel-burning appliance shall bear the appliance manufacturer's permanent marking designating the type(s) of fuel for which it is listed. If listed and installed for use with either LP gas or natural gas, the appliance manufacturer's permanent instructions regarding conversion from one fuel to the other shall be supplied.

6.6 Accessibility. Every appliance shall be accessible for inspection, service, repair, and replacement without removing permanent construction. Sufficient room shall be available to enable the operator to observe the burner, control, and ignition means while starting the appliance.

6.7 Location. Heat-producing appliances shall be so located that doors, drapes, or other such material cannot be placed or swung closer to the front of the appliance than the clearances specified on the labelled appliances.

6.8 Clearances.

6.8.1 Clearances between heat-producing appliances and adjacent surfaces shall be not less than as specified in the terms of their listing. Clearance spaces shall be framed in or guarded to prevent creation of storage space within the clearance specified. The only exception to framing-in or guarding such spaces will be those necessary to allow access to shutoff valves or controls in order to comply with Section 5.1.9 (Concealed Joints) and Section 6.2.1 of this Part, in which case the unguarded area must have a warning tag posted in an easily readable location, as follows:

WARNING
DO NOT STORE COMBUSTIBLE MATERIAL IN THIS AREA

6.8.2 Ranges. Ranges shall have a vertical clearance between the cooking top and combustible material or metal cabinets, in accordance with Table 7 or the terms of their listings.

Editor's Note: Retain present Table 7 as published in NFPA 501C—1972, page 61.

6.9 Circulating Air System.
6.9.1. **Supply System.**

**6.9.1.1 Duct Material.** Supply ducts shall be made from galvanized steel, tin-plated steel, or aluminum, or shall be listed Class 0, Class 1 or Class 2 air ducts. Class 2 air ducts shall be located at least three feet (3') from the furnace bonnet or plenum. A duct system integral with the structure shall be of durable construction that can be demonstrated to be equally resistant to fire and deterioration. Ducts constructed from sheet metal shall be in accordance with Table 8.

<table>
<thead>
<tr>
<th>Diameter or Width</th>
<th>Diameter or Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 inches or less</td>
<td>14 inches or less</td>
</tr>
<tr>
<td>Round Exposed</td>
<td>0.013 in</td>
</tr>
<tr>
<td>Enclosed Rectangular or Round</td>
<td>0.013 in</td>
</tr>
<tr>
<td>Exposed Rectangular</td>
<td>0.016 in</td>
</tr>
</tbody>
</table>

*When "nominal" thicknesses are specified, 0.003 inch shall be added to these "minimum" metal thicknesses.

**6.9.1.2 Sizing of Supply Ducts.** Ducts shall be designed so that when a labeled forced-air furnace is installed and operated continually at its normal input rating in the recreational vehicle, with all registers in full open position, the static pressure measured in the duct plenum shall not exceed that shown on the label of the appliance. When an air-cooling coil is installed in the system, the total static pressure of the coil and the system shall not exceed that shown on the label of the appliance. The minimum dimension of any branch duct shall be at least one and one-half inches (1 ½”) and of any main duct, two and one-half inches (2 ½”).

**6.9.1.3 Airtightness of Supply Duct Systems.** A supply duct system shall be considered substantially airtight when the static pressure in the duct system, with all registers sealed and with the furnace air circulator at high speed, is at least 80 percent of the static pressure measured in the furnace casing, with its outlets sealed and the furnace air circulator operating at high speed. Pressures shall be measured with a water manometer or equivalent device calibrated to read in increments not greater than one-tenth inch (1/10”) water column.
6.9.2 Return Air System.

6.9.2.1 Return Air Openings. Provisions shall be made to permit the return of circulating air from all rooms and living spaces, except toilet room(s), to the circulating air supply inlet of the furnace.

6.9.2.2 Return Duct Material. Return air ducts, if used, shall be in accordance with the following:

a. Portions of return air ducts directly above the heating surfaces or closer than 2 feet from the outer jacket or casing of the furnace, shall be constructed of metal in accordance with Table 8 or shall be listed Class 0 or Class I air ducts.

b. Return air ducts, except as required in “a” above, shall be constructed of one-inch (nominal) wood boards (flame spread classification of not more than 200), or other suitable material no more combustible than one-inch board, in accordance with 6.9.1.1.

c. The interior of combustible ducts (ducts of material other than as specified in 6.9.1.1) shall be lined with noncombustible material at points where there might be danger from incandescent particles dropped through the register or furnace, such as directly under floor registers and bottom of vertical ducts or directly under furnaces having bottom return.

6.9.2.3 Sizing of Return Air Ducts. The cross-sectional area of the return air duct shall not be less than 2 square inches for each 1,000 Btu per hour input rating of the appliance. Dampers shall not be placed in any return air duct, except that a diverting damper may be placed in a combination fresh air intake and return air duct so arranged that the required cross-sectional area will not be reduced at all possible positions of the damper.

6.9.2.4 Permanent Unclosable Openings. Living areas not served by return air ducts and closed off from the return opening of the furnace by doors, sliding partitions, or other means, shall be provided with permanent unclosable openings in the doors or separating partitions to allow circulated air to return to the furnace. Such openings may be grilled or louvered. The net free area of each opening shall be not less than one square inch (1 sq. in.) for every five square feet (5 sq. ft.) of total living area closed off from the furnace by the door or partition serviced by that opening. Under-cutting doors connecting the closed-off area may be used as a means of providing return air area. However, in the event that doors are undercut, they shall be undercut a minimum of two inches (2") and no more than two and one-half inches (2½").
and no more than one-half of the free air area so provided shall be considered as return air area.

6.9.3 **Joints and Seams.** Joints and seams of ducts shall be securely fastened and made substantially airtight. Slip joints shall have a lap of at least one inch (1') and shall be individually fastened. Tape or caulking compound may be used for sealing mechanically secure joints. Where used, tape or caulking compound shall not be subject to deterioration under long exposures to temperatures up to 200° Fahrenheit and to conditions of high humidity, excessive moisture, or mildew.

6.9.5 **Supports.** Ducts shall be securely supported.

6.9.5 **Registers or Grills.** Fittings connecting the registers or grills to the duct system shall be constructed of metal or material which complies with the requirements for Class 0, Class 1 or 2 air ducts under Underwriters' Laboratories, Inc. *Standard for Air Ducts, UL 181.* Registers or grills shall be constructed of metal or conform with the following:

6.9.5.1 Be made of a material classified 94VE-0 or 94VE-1 when tested as described in Underwriters' Laboratories, Inc. *Standard for Tests of Flammability of Plastic Materials, UL94 — 1972.*

6.9.5.2 Floor registers or grills shall resist without structural failure a 200 lb. concentrated load on a 2 in. diameter disc applied to the most critical area of the exposed face of the register or grill. For this test the register or grill is to be at a temperature of not less than 165°F and is to be supported in accordance with the manufacturer's instructions.

93. **New Part IV.** Insert the following new Part IV covering Fire and Life Safety Provisions for Recreational Vehicles to read:

**Part IV — Fire and Life Safety**

1. **Introduction**

1.1 Those members of the engineering profession and others associated with the design, manufacturing and inspection of recreational vehicles have been aware of the need for uniform technical standards leading to the safe use of this special type of equipment. They have also recognized that because of conditions of transport, size and use, existing standards for permanent buildings are not completely applicable to recreational vehicles. It is with these factors in mind that Part IV of this Standard has been developed.
1.2 Much of the material in Part IV has been taken from, or is based on nationally recognized standards for fire and life safety.

2. Scope

2.1 Part IV of this Standard covers fire, life safety, and exiting requirements for recreational vehicles when used for temporary living quarters.

2.2 This Standard is not intended as a design specification or an instruction manual for untrained persons.

2.3 Wherever nationally recognized standards and Part IV of this Standard differ, the requirements of Part IV shall apply.

2.3.1 Federal regulations under the National Highway Traffic Safety Administration may supersede all or part of this section as applied to any category of regulated motor vehicles.

2.4 The provisions of this Standard are not intended to prevent the use of any material, installation, arrangement, or method of construction not specifically prescribed herein, provided any such alternate has been approved. The enforcement authority shall approve such alternate if the material, installation, arrangement or method of construction is at least the equivalent of that prescribed by this Part, and may require tests or proof of compliance to substantiate any claims that may be made regarding the use of any such alternate.

3. Definitions

Interior Finish: The exposed interior surface of walls, fixed or movable partitions, ceilings and other interior surfaces, except floors and floor coverings, affixed to the recreational vehicle structure. Interior finish does not include decorations or furnishings which are not affixed to the recreational vehicle structure.

4. Interior Walls, Partitions, and Ceilings

4.1 Except as provided in 4.2, the interior surfaces of walls, fixed or movable partitions, and ceilings of habitable areas and hallways, excluding bath and toilet rooms, molding, doors, trim, cabinets, splash panels and furnishings, shall be of materials whose flame-spread classification shall not exceed 200 when tested by the Standard Method of Test for Surface Burning Characteristics of Building Materials (ANSI A2.5–1970; ASTME 84–70; UL 723–1971; NFPA No. 255–1972).

4.2 Where the walls, partitions or ceilings consist of textile or film materials such as tent fabric, insect screening, flexible plastic weather protection, etc., they shall conform to the requirements

5. Exit Facilities

5.1 Recreational vehicles shall have a minimum of two means of egress located remote from each other and so arranged as to provide a means of unobstructed travel to the outside of the vehicle.

5.2 The alternate means of egress in motor homes and truck campers shall be located on a wall other than that wall in which the main vehicle exit door is located, or shall be located in the roof.

5.3 The bottom of the alternate means of egress shall not be more than four (4) feet above the vehicle floor or above a readily accessible horizontal surface capable of supporting a weight of 300 pounds.

5.4 The latch mechanism of any required exit facility shall be operable by hand, and shall not require the use of a key or special tool for operation from the inside.

5.5 The alternate exit shall provide an opening large enough to admit unobstructed passage, keeping the major axis horizontal at all times, of an ellipsoid generated by rotating about its minor axis an ellipse having a major axis of 20 inches and a minor axis of 13 inches.

5.6 Alternate exits shall be labeled with the word "EXIT" with \( \frac{1}{2} \)" minimum letters on a contrasting background.

6. Fire Protection

6.1 Each recreational vehicle equipped with fuel-burning appliances or an internal combustion engine shall be provided with a listed portable fire extinguisher with a minimum rating of 2B:C as defined in the *Standard for the Installation of Portable Fire Extinguishers* (NFPA No. 10–1973; ANSI Z112.1–1973) which shall be located in a readily accessible position when the vehicle is occupied.
Part III — Electrical Systems

1. Introduction

1.1 Electrical engineers associated with the design, manufacturing, installation, and inspection of recreational vehicle electrical systems have been aware of the need for uniform technical standards leading to the safe use of this special type of equipment. They have also recognized that because of conditions of transport and use, existing electrical equipment standards for motor vehicles or for buildings are not completely applicable to recreational vehicles. It is with these factors in mind that Part III of this Standard has been developed.

1.2 Much of the material in Part III has been taken from, or is based on the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974).

2. Scope

2.1 Part III of this Standard covers the electric conductors and equipment installed within or on recreational vehicles and also the conductors that connect them to a supply of electricity.

2.2 This Standard is not intended as a design specification or an instruction manual for untrained persons.

2.3 The provisions of this Standard are not intended to prevent the use of any material, appliance, installation, device, arrangement, or method of construction not specifically prescribed herein, provided any such alternative has been approved or listed. The enforcement authority shall approve such alternate if the material, appliance, installation, device, arrangement or method of construction is at least the equivalent of that prescribed by this Part, and may require tests or proof of compliance, to substantiate any claims that may be made regarding the use of any such alternate.
3. Definitions

**Accessible (as applied to equipment):** Admitting close approach because not guarded by locked doors, elevation or other effective means. (See Readily Accessible.)

**Accessible (As Applied to Wiring Methods.)** Capable of being removed or exposed without damaging the recreational vehicle structure or finish, or not permanently closed-in by the structure or finish of the recreational vehicle (see “Concealed” and “Exposed”).

**Air-Conditioning or Comfort Cooling Equipment:** All of that equipment intended or installed for the purpose of processing the treatment of air so as to control simultaneously its temperature, humidity, cleanliness and distribution to meet the requirements of the conditioned space.

**Ampacity:** Current-carrying capacity of electric conductors expressed in amperes.

**Appliance:** Utilization equipment, generally other than industrial, normally built in standardized sizes or types which is installed or connected as a unit to perform one or more functions such as clothes washing, air conditioning, food mixing, deep frying, etc.

**Appliance, Fixed.** An appliance which is fastened or otherwise secured at a specific location.

**Appliance, Portable.** An appliance which is actually moved or can easily be moved from one place to another in normal use.

Note: For the purpose of this Standard, a refrigerator or similar appliance is considered portable if cord connected.

**Appliance — Stationary:** An appliance which is not easily moved from one place to another in normal use.

**Approved:** Means acceptable to the authority having jurisdiction.

**Attachment Plug (Plug Cap) (Cap).** A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

**Automatic:** Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change

*Definition identical to that appearing in the National Electrical Code.*
in current strength, pressure, temperature, or mechanical configuration.

*Bonding. The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

*Bonding Jumper: A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

*Bonding Jumper — Circuit: The connections between portions of a conductor in a circuit to maintain required ampacity of the circuit.

*Branch Circuit. The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

Note: A device not approved for branch circuit protection such as a thermal cutout or motor overload protective device is not considered as the overcurrent device protecting the circuit.

*Branch Circuit — Appliance. A branch circuit supplying energy to one or more outlets to which appliances are to be connected; such circuits to have no permanently connected lighting fixtures not a part of an appliance.

*Branch Circuit — General Purpose. A branch circuit that supplies a number of outlets for lighting and appliances.

*Branch Circuit — Individual: A branch circuit that supplies only one utilization equipment branch.

*Branch Circuit — Multiwire: A branch circuit consisting of two or more ungrounded conductors having a potential difference between them, and an identified grounded conductor having equal potential difference between it and each ungrounded conductor of the circuit and which is connected to the neutral conductor of the system.

*Cabinet: An enclosure designed either for surface or flush mounting, and provided with a frame, mat or trim in which swinging doors are hung.

*Circuit Breaker: A device designed to open and close a circuit by nonautomatic means, and to open the circuit automatically on a predetermined overload of current without injury to itself when

*Definition identical to that appearing in the National Electrical Code.
properly applied within its rating.

Concealed: Rendered inaccessible by the structure or finish of the recreational vehicle. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. (See "Accessible as applied to wiring methods")

Conductor:
*Bare: A conductor having no covering or insulation whatsoever. (See Conductor, Covered.)

*Covered: A conductor encased with material that is not recognized by the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974) as insulation. (See Conductor, Bare.)

*Insulated: A conductor encased within material recognized by the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974) as insulation.

*Connector, Pressure (Solderless). A device that establishes a connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder.

*Converter: A device which changes electrical energy from one form to another, as from alternating current to direct current.

*Cooking Unit, Counter-Mounted: A cooking appliance designed for mounting in or on a counter and consisting of one or more heating elements, internal wiring, and built-in or separately mountable controls. (See "Oven, Wall-Mounted").

Dead Front (As Applied to Switches, Circuit-Breakers, Switchboards, and Distribution Panelboard). So designed, constructed, and installed that no current-carrying parts are normally exposed on the front.

*Demand Factor. The ratio of the maximum demand of a system, or part of a system, to the total connected load of a system or the part of the system under consideration.

*Device. A unit of an electrical system that is intended to carry but not utilize electrical energy.

Direct Current (DC): A non-alternating flow of energy within a circuit having an electromotive force or potential (not exceeding 25 volts, for the purposes of this Standard).

*Definition identical to that appearing in the National Electrical Code.
*Disconnection Means*: The necessary equipment usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors in a recreational vehicle and intended to constitute the means of cutoff for the supply to that recreational vehicle.

*Note*: Receptacles used as disconnecting means shall be accessible (as applied to wiring methods) and capable of interrupting their rated current without hazard to the operator.

*Distribution Panelboard*: A single panel or group of panel units designed for assembly in the form of a single panel; including buses, and with or without switches and/or automatic overcurrent protective devices for the control of light, heat or power circuits of small individual as well as aggregate capacity; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front.

*Enclosed*: Surrounded by a case that will prevent a person from accidentally contacting live parts.

*Equipment*: A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like used as a part of, or in connection with, an electrical installation.

*Exposed (As Applied to Live Parts)*. Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "Accessible" and "Concealed".)

*Exposed (As Applied to Wiring Method)*. On or attached to the surface or behind panels designed to allow access. [See "Accessible (As Applied to Wiring Methods")]

*Externally Operable*. Capable of being operated without exposing the operator to contact with live parts.

*Feeder*: All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch circuit overcurrent device.

*Fitting*: An accessory, such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

*Ground*: A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth or to some conducting body that serves in place of the earth.

*Definition identical to that appearing in the National Electrical Code.*
**Grounded:** Connected to earth or to some conducting body that serves in place of the earth.

**Grounded Conductor:** A system or circuit conductor that is intentionally grounded.

**Grounding Conductor:** A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

**Grounding Conductor, Equipment:** The conductor used to connect noncurrent-carrying metal parts of equipment, raceways and other enclosures to the system grounded conductor at the service and/or the grounding electrode conductor.

**Isolated:** Not readily accessible to persons unless special means for access are used.

**Labeled:** Equipment or materials to which has been attached a label, symbol, or other identifying mark of a nationally recognized testing laboratory that maintains periodic inspection of production of labeled equipment or materials and by whose labeling is indicated compliance with nationally recognized standards or tests to determine suitable usage in a specified manner.

**Lighting Outlet:** An outlet intended for the direct connection of a lampholder, a lighting fixture or a pendant cord terminating in a lampholder.

**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.

**Low-Voltage:** An electromotive force rated at nominal 24 volts or less, supplied from a transformer, converter, or battery.

**Nonautomatic:** Action requiring personal intervention for its control. (See “Automatic”.)

**Outlet:** A point on the wiring system at which current is taken to supply utilization equipment.

**Oven, Wall Mounted:** An oven for cooking purposes designed for mounting in or on a wall or other surface and consisting of one or more heating elements, internal wiring, and built-in or

*Definition identical to that appearing in the National Electrical Code.*
separately mountable controls. (See "Cooking Unit, Counter-Mounted").

*Power Supply Assembly: The conductors, including the grounding conductors, insulated from one another, the connectors, attachment plug caps, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the distribution panelboard within the recreational vehicle.

Raceway. Any channel for holding wires, cables, or busbars that is designed expressly for, and used solely for, this purpose.

Note: Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, structural raceways, wireways, and busways.

*Raintight: So constructed or protected that exposure to a beating rain will not result in the entrance of water.

*Readily Accessible: Capable of being reached quickly for operation, renewal, or inspection, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See Accessible.)

*Receptacle: A receptacle is a contact device installed at the outlet for connection of a single attachment plug.

Note: A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

*Receptacle Outlet: An outlet where one or more receptacles are installed.

*Transformer: A device, which when used, will raise or lower the voltage of alternating current of the original source.

*Utilization Equipment: Equipment that utilizes electric energy for mechanical, chemical, heating, lighting, or similar purposes.

*Ventilated: Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes or vapors.

Voltage (of a Circuit): The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

*Definition identical to that appearing in the National Electrical Code.
**Watertight:** So constructed that moisture will not enter the enclosing case.

**Weatherproof:** So constructed or protected that exposure to the weather will not interfere with successful operation.

*Note:* Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

4. **Low-Voltage Systems**

4.1 **Low-Voltage Circuits.** Low-voltage circuits furnished and installed by the recreational vehicle manufacturer, other than those related to braking, are subject to this Standard. Circuits supplying lights subject to Federal or State regulations shall be in accordance with applicable government regulations but shall not be lower than provided by this Standard.

4.2 **Low-Voltage Wiring Materials.**

4.2.1 Copper conductors shall be used for low-voltage circuits.

4.2.2 The insulation of low-voltage conductors shall be rated at least 60°C.

4.2.3 Conductors furnished and installed by the recreational vehicle manufacturers shall have a minimum of 30 mils thermoplastic insulation or equal.

4.2.4 The insulation of outdoor or under-chassis wire shall be moisture and heat resistant, Type THW or equivalent.

4.2.5 Single-wire, low-voltage conductors shall be of the stranded type.

*Exception:* Metal chassis or frame shall be permitted as the return path for exterior lighting. Terminals for connection to the chassis or frame shall be of the solderless type and approved for the size and type wire used. Mechanical connections to the frame or chassis shall be made secure.

4.3 **Low-Voltage Wiring Methods.**

4.3.1 Conductors shall be protected against physical damage and shall be secured. Where insulated conductors are clamped to the structure, the conductor insulation shall be supplemented by an additional wrap or layer of equivalent material, except that

*Definition identical to that appearing in the National Electrical Code.*
jacketed cables need not be so protected. Wiring shall be routed away from sharp edges, moving parts or heat sources.

4.3.2 Conductors shall be spliced or joined with approved splicing devices or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices, joints, and free ends of conductors shall be covered with an insulation equivalent to that on the conductors.

4.3.3 Battery and direct-current circuits shall be physically separated by at least a one-half inch (\(\frac{1}{2}\)) gap or other approved means, from circuits of a different power source. This shall be accomplished by clamping, routing, or equivalent means which ensure permanent total separation.

4.4 Battery Installations. Storage batteries subject to the provisions of this Standard shall be securely attached to the vehicle and installed in an area vapor tight to the interior and ventilated directly to the exterior of the vehicle. When batteries are installed in a compartment, the compartment shall be ventilated with openings of not less than 2 square inches at the top and 2 square inches at the bottom. Batteries shall not be installed in a compartment containing spark or flame producing equipment.

4.5 Overcurrent Protection.

4.5.1 Low-voltage circuit wiring shall be protected by overcurrent protective devices rated not in excess of the ampacity of copper conductors, as follows:

<table>
<thead>
<tr>
<th>Wire Size</th>
<th>Area Cir. Mils</th>
<th>Ampacity</th>
<th>Wire Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>1620</td>
<td>6</td>
<td>Stranded only</td>
</tr>
<tr>
<td>16</td>
<td>2580</td>
<td>8</td>
<td>Stranded only</td>
</tr>
<tr>
<td>14</td>
<td>4110</td>
<td>15</td>
<td>Stranded or solid</td>
</tr>
<tr>
<td>12</td>
<td>6530</td>
<td>20</td>
<td>Stranded or solid</td>
</tr>
<tr>
<td>10</td>
<td>10380</td>
<td>30</td>
<td>Stranded or solid</td>
</tr>
</tbody>
</table>

Note: For other allowable conductor ampacities, refer to the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974), Table 310-12.

4.5.2 Circuit breakers or fuses shall be of the listed or approved type, including automotive types. Fuseholders shall be clearly
marked with maximum fuse size.

Note: For further information see Society of Automotive Engineers (SAE) Standard J554 — 1968 and Underwriters’ Laboratories, Inc. Standard 275b.

4.5.3 Higher current-consuming direct-current appliances such as pumps, compressors, heater blowers and similar motor-driven appliances shall be listed and installed in accordance with the manufacturer’s instructions. Motors which are controlled by automatic switching or by latching-type manual switches shall be protected in accordance with Section 430-32.(c) of the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974).

4.5.4 The overcurrent protective device shall be installed in an accessible location on the vehicle as close as practical to the point where the power supply connects to the vehicle circuits. If located outside the recreational vehicle, the device shall be protected against weather and physical damage.

4.6 Switches. Switches shall be rated at not less than the connected load.

5. Combination Electrical Systems

5.1 General. Vehicle wiring suitable for connection to a battery or direct-current supply source shall be permitted to be connected to a 115-volt source provided that the entire wiring system and equipment are rated and installed in full conformity to Section 7 of this Standard covering 115-volt electrical systems. Circuits fed from alternating-current transformers shall not supply direct-current appliances.

5.2 Voltage Converters (115-volt Alternating Current to Low Voltage Direct Current). The 115-volt alternating current side of voltage converters shall be wired in full conformity with the provisions of Section 7 of this Standard for 115-volt electrical systems. Converters supplied as an integral part of a listed appliance shall not be subject to the above. All converters and transformers shall be listed and shall be used within their marked electrical ratings.

5.3 Dual-Voltage Fixtures or Appliances. Fixtures or appliances having both 115-volt and low-voltage connections shall be listed or approved for dual voltage by a nationally recognized testing laboratory.

5.4 Autotransformers. Autotransformers shall not be used.
5.5 Receptacles and Plug Caps. When a recreational vehicle is equipped with a 120-volt or 120/240-volt alternating-current system and/or a low-voltage system, receptacles and plug caps of the low-voltage system shall differ in configuration from those of the 120- or 120/240-volt system.

5.6 Identification.

5.6.1 When a vehicle equipped with a battery or direct-current system has an external connection for low-voltage power, the receptacle shall have a configuration that will not accept 120-volt power. The vehicle shall have permanently affixed on the outside wall adjacent to the point of entrance of the power supply conductors a tag which reads:

THIS CONNECTION IS FOR LOW-VOLTAGE BATTERY OR DIRECT CURRENT ONLY. DO NOT CONNECT TO 120 OR 240 VOLTS AC.

5.6.2 The tag shall be 3 inches by 1\(\frac{3}{4}\) inches minimum size, made of etched, metal-stamped or embossed brass, stainless steel, anodized or alclad aluminum not less than 0.020 inch thick, or other approved material (e.g., 0.005 inch plastic laminates).

6. General Installations

6.1 Mounting. Generators shall be mounted in such a manner as to be effectively bonded to the recreational vehicle chassis.

6.2 Generator Protection. Equipment shall be installed to ensure that the generator is disconnected when the vehicle is energized from an outside source and to ensure that the outside source is disconnected when the vehicle is energized by the generator. The generator field shall be protected by appropriately rated, listed equipment.

6.3 Installation of Generators. Internal-combustion-driven generator units subject to the provisions of this Standard shall be secured in place to avoid displacement from vibration and road shock and shall be installed in a compartment which is vapor-tight to the interior of the vehicle. (See 4.4 for battery installations.)

6.4 Ventilation of Generator Compartments. Compartments accommodating internal-combustion-driven generator units shall be provided with approved ventilation in accordance with instruc-
6.5 **Location of Internal-Combustion-Engine Generator Exhaust.** Exhaust from generator internal-combustion engines shall not terminate adjacent to the vehicle gasoline-tank filler-spout inlet.

6.6 **Feeder Conductors.** Feeder conductors from the generator(s) to the junction box (having a blank cover) on the compartment wall shall be of the stranded type installed in flexible conduit.

7. **Nominal 115 or 115/230 Volt Systems**

7.1 **General Requirements.** The electrical equipment and material of recreational vehicles indicated for connection to a wiring system nominally rated 115 volts, 2-wire with ground, or a wiring system nominally rated 115/230 volts, 3-wire with ground, shall be approved and installed in accordance with the requirements of this Standard and Article 551 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).

7.2 **Materials and Equipment.** Electrical materials, devices, appliances, fittings, and other equipment installed, intended for use in, or attached to the recreational vehicle shall be approved for the purpose. All products shall be used only in the manner in which they have been tested and found suitable for the intended use.

7.3 **Receptacle Outlets Required.**

7.3.1 Receptacle outlets shall be installed at wall spaces two feet (2') wide or more, so that no point along the floor line is more than six feet (6'), measured horizontally, from an outlet in that space.

*Exception No. 1: Bath and hall areas.*

*Exception No. 2: Wall spaces occupied by kitchen cabinets, wardrobe cabinets, built-in furniture, behind doors which may open fully against a wall surface, or similar facilities.*

7.3.1.1 Receptacle outlets shall be installed:

a. Adjacent to counter tops in the kitchen (at least one on each side of the sink if counter tops are on each side and are twelve inches (12") or over in width).

b. Adjacent to the refrigerator and gas-range space, except
when a gas-fired refrigerator or cooking appliance, requiring no external electrical connection, is factory installed.

c. Adjacent to counter top spaces (and built-in vanities) which cannot be reached from a receptacle required in 7.3.1.1.a. by a cord of six feet (6') without crossing a traffic area, cooking appliance or sink.

7.3.2 When installed adjacent to a bathroom lavatory, the receptacle outlet shall be a minimum of thirty inches (30") from the floor. The receptacle outlet shall be permitted in a listed lighting fixture. A receptacle outlet shall not be installed in a tub, shower enclosure, or combination shower compartment.

7.3.3 A receptacle shall not be installed in a face-up position in any counter top or similar horizontal surfaces within the living area.

7.4 Branch Circuits Required.

7.4.1 The branch circuits required in a recreational vehicle shall conform to 7.15 and be determined in accordance with 7.4.1.1, 7.4.1.2, 7.4.1.3 or 7.4.1.4. When provisions are made to facilitate future installations of an electrical appliance, the anticipated load of such appliance shall be counted in the total rating of fixed appliances (e.g., airconditioning prewiring).

7.4.1.1 Recreational vehicles with not more than eight (8) lighting and receptacle outlets combined shall have either:

a. One 15-ampere general-purpose branch circuit to supply these outlets, provided the total rating of fixed appliances connected to this circuit does not exceed 600 watts, or

b. One 20-ampere general-purpose branch circuit, to supply these outlets, provided the total rating of fixed appliances connected to this circuit does not exceed 1,000 watts.

Vehicles wired in accordance with a. or b. shall not be equipped with electrical heating or cooking appliances.

7.4.1.2 Recreational vehicles with more than eight (8) lighting and receptacle outlets combined shall have one 20-ampere appliance branch circuit, and either:

a. One 15-ampere branch circuit to supply these outlets, provided this circuit does not supply receptacles in the cooking and dining area(s) or electrical heating or cooking appliances, and provided the total rating of fixed appliances connected to this circuit does not exceed 600 watts, or

b. One 20-ampere branch circuit, to supply these outlets, pro-
vided this circuit does not supply receptacles in the cooking and
dining area(s) or electrical heating or cooking appliances, and
provided the total rating of fixed appliances connected to this
circuit does not exceed 1,000 watts.

7.4.1.3 Recreational vehicles having a panelboard and a feeder
assembly rated not less than 30 amperes shall be permitted to have
installed the following circuits:

a. One 20-ampere circuit for use with air conditioner rated not
more than 16 amperes, and
b. One 20-ampere portable appliance circuit, and/or
c. One 15-ampere branch circuit for lights and receptacles and
fixed appliances rated not more than 600 watts.

7.4.1.4 Calculations for Lighting and Appliance Load. When
7.4.1.2 and 7.4.1.3 (relative to recreational vehicles with more than
eight (8) lighting and receptacle outlets combined) is not applied,
the following method shall be employed in computing the power-
supply assembly and distribution panelboard load for the recre-

<table>
<thead>
<tr>
<th>Lighting:</th>
<th>Length times width of vehicle (outside dimensions, exclusive of hitch and cab) times three watts per square foot, e.g.,</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Length × width × 3 = lighting watts.</td>
</tr>
<tr>
<td>Small Appliance:</td>
<td>Number of circuits times 1,500 watts for each 20 ampere appliance receptacle circuit, e.g.,</td>
</tr>
<tr>
<td>B.</td>
<td>Number of Circuits × 1,500 = small appliance watts.</td>
</tr>
<tr>
<td>Total:</td>
<td>Lighting watts plus small appliance watts = total watts.</td>
</tr>
<tr>
<td>D.</td>
<td>First 3,000 total watts at 100 per cent plus remainder at 35 per cent = watts to be divided by voltage to obtain current (amperes) per leg.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amperes per Leg</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
</tbody>
</table>

E. Add nameplate amperes for motors and heater loads (exhaust fans, air conditioners, electric, gas, or oil heating) =

F. Add 25 per cent of amperes of largest motor in (E) =

*Omit smaller of these two except include any motor common to both functions.
G. Add nameplate amperes for:**

Disposal
Water Heater
Wall-Mounted Ovens
Cooking Units

\[ \text{TOTAL} = \text{_______} + \text{_______} = \text{_______} \]

H. Add amperes for free-standing range as distinguished from separate ovens and cooking units. Derive from following table by dividing watts by 230 volts.

<table>
<thead>
<tr>
<th>Range</th>
<th>Name Plate Rating</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Free standing range as distinguished from separate oven and cooking units)</td>
<td>10,000 w or less 80 per cent of rating</td>
<td>10,001–12,500 w 8,000 w</td>
</tr>
<tr>
<td></td>
<td>12,501–13,500 w</td>
<td>8,400 w</td>
</tr>
<tr>
<td></td>
<td>13,501–14,500 w</td>
<td>8,800 w</td>
</tr>
<tr>
<td></td>
<td>14,501–15,500 w</td>
<td>9,200 w</td>
</tr>
<tr>
<td></td>
<td>15,501–16,500 w</td>
<td>9,600 w</td>
</tr>
<tr>
<td></td>
<td>16,501–17,500 w</td>
<td>10,000 w</td>
</tr>
</tbody>
</table>

I. If outlets or circuits are provided for other than factory-installed major appliances, the anticipated load shall be added for each.

\[ \text{TOTAL} = \text{_______} \]

When the total for Legs A and B are unequal, use the larger to determine the distribution panel and supply cord rating.

(Service amperes shall not exceed supply cord rating. See 7.6.)

**When number of appliances is four or more use 75 per cent of total.

7.5 Branch Circuit Protection.

7.5.1 The branch-circuit overcurrent devices shall be rated:

a. Not more than the circuit conductors; and

b. Not more than 150 percent of the rating of a single appliance rated 10-amperes or more and supplied by an individual branch circuit; but

c. Not more than the fuse size marked on the air conditioner or other motor-operated appliance.
7.5.2 A 20-ampere fuse or circuit breaker shall be considered adequate protection for fixture leads, cords, or portable appliances and No. 14 AWG (American Wire Gage) tap conductors, not over 6 feet long for recessed lighting fixtures.

7.5.3 If more than one outlet or load is on a branch-circuit, a 15-ampere receptacle shall be considered protected by a 20-ampere fuse or circuit breaker.

7.6 Power-Supply Assembly.

7.6.1 Recreational vehicles wired in accordance with 7.4.1.1.a. shall use a listed 15-ampere, or larger, main power-supply assembly (See 7.9.1, 7.9.3.a., and 7.9.4).

7.6.2 Recreational vehicles wired in accordance with 7.4.1.1.b. shall use a listed 20-ampere, or larger, main power-supply assembly. (See 7.9.1, 7.9.3.b, and 7.9.4).

7.6.3 Recreational vehicles wired in accordance with 7.4.1.2, 7.4.1.3 or 7.4.1.4 shall use a listed 30-ampere, or larger, main power-supply assembly. (See 7.9.1, 7.9.3.c, and 7.9.4).

7.6.4 In accordance with 7.4.1.4, any recreational vehicle with a rating in excess of 30-amperes, 115 volts, shall use a listed 40-ampere or 50-ampere 115/230-volt power-supply assembly (C73.17 — 1972 configuration). (See 7.9.1, 7.9.3.d, and 9.7.4).

Exception No. 1: When the calculated load of the recreational vehicle exceeds 30-amperes, 115 volts, a second power-supply cord may be installed when permitted by the authority having jurisdiction. Where a two-cord supply system is installed, they shall not be interconnected on either the line side or the load side. The grounding circuits and grounding means shall be electrically interconnected.

Exception No. 2: For a dual-supply source consisting of a generator and a power-supply cord, see 7.8.

7.7 Distribution Panelboard.

7.7.1 A listed and appropriately rated distribution panelboard or other equipment specifically listed for the purpose shall be used. The distribution panelboard shall be of the insulated neutral type, with the grounding bar attached to the metal frame of the panelboard or other approved grounding means.

7.7.2 The distribution panelboard shall be installed in a readily accessible location and shall be permitted to be located in a closet.
7.7.3 The distribution panelboard shall be of the dead-front type and shall consist of one or more circuit breakers or Type S fuseholders. A main disconnecting means shall be provided where fuses are used or where more than two circuit breakers are employed.

7.8 Dual Supply Source.

7.8.1 Where a dual-supply system, consisting of a generator and a power-supply cord is installed, the feeder from the generator shall be protected by an overcurrent protective device. Installation shall be in accordance with Sections 6.1 and 6.2.

7.8.2 Calculation of loads shall be in accordance with 7.4.1.4.

7.8.3 The two supply sources need not be of the same capacity.

7.8.4 If the AC generator source exceeds 30 amperes, 115 volts, it shall be permitted to be wired either as a 115-volt system or a 115/230-volt system, providing an overcurrent protective device of the proper rating is installed in the feeder.

7.8.5 The external power-supply assembly shall be permitted to be less than the calculated load but not less than 30 amperes and shall have overcurrent protection not greater than the capacity of the external power-supply assembly.

7.9 Means for Connecting to Power Supply.

7.9.1 Assembly. The power-supply assembly or assemblies shall be factory-supplied (see 7.9.1.a.) or factory-installed when of the permanently connected type as specified in 7.9.1.b.

a. Separable. When a separable power-supply assembly consisting of a cord with a female connector and molded attachment plug cap is provided, the vehicle shall be equipped with a permanently mounted, listed, male-recessed-type motorbase receptacle wired directly to the distribution panel by an approved wiring method. The attachment plug cap shall be of an approved or listed type. (See Sections 7.6 and 7.9.3)

b. Permanently Connected. Each power-supply assembly shall be connected directly to the terminals of the distribution panel or conductors within an approved junction box and provided with means to prevent strain from being transmitted to the terminals. The ampacity of the conductors between each junction box and the terminals of each distribution panel shall be equal to the ampacity of the power-supply cord. The supply end of the assembly shall be
7.9.2 Cord. The cord set shall be listed as suitable for use with recreational vehicles. The cord shall be not less than 20 feet as measured from the point of entrance to the recreational vehicle or the face of the motor-base attachment plug nor more than 26 ½ feet in length overall to the face of the attachment plug at the supply end.

7.9.3 Attachment Plugs.

a. Recreational vehicles having only one 15-ampere branch circuit as permitted by 7.4.1.1.a. shall have an attachment plug which shall be 2-pole, 3-wire, grounding-type, rated 15-amperes, 125 volts, conforming to the configuration shown in Figure 7.9.3.

Note: Complete details of this configuration can be found in American National Standard ANSI C73.11 — 1972.

b. Recreational vehicles having only one 20-ampere branch circuit as permitted in 7.4.1.1.b. shall have an attachment plug which shall be 2-pole, 3-wire, grounding-type, rated 20-amperes, 125 volts, conforming to the configuration shown in Figure 7.9.3.

Note: Complete details of this configuration can be found in American National Standard ANSI C73.12 — 1973.

c. Recreational vehicles wired in accordance with 7.4.1.2, 7.4.1.3, or 7.4.1.4 shall have an attachment plug which shall be 2-pole, 3-wire, grounding-type, rated 30-amperes, 125 volts, conforming to the configuration shown in Figure 7.9.3, intended for use with units rated at 30-amperes, 125 volts.

Note: Complete details of this configuration can be found in American National Standard ANSI C73.13 — 1972.

d. Recreational vehicles having a power-supply assembly rated 40-amperes or 50-amperes as permitted by 7.4.1.3 shall have a 3-pole, 4-wire, grounding-type attachment plug rated 50-amperes, 125/250 volts, conforming to the configuration shown in Figure 7.9.3.

Note: Complete details of this configuration can be found in American National Standard ANSI C73.17 — 1972.

7.9.4 Labeling at Electrical Entrance: Each recreational vehicle shall have permanently affixed to the exterior skin at or near the point of entrance of the power-supply cord(s) a tag 3 inches by 1¾ inches minimum size, made of etched, metal-stamped or em-
Receptacles Caps

20 amp
125-volt, 20-amp, 2-pole, 3-wire, grounding type
125-volt, 2-pole, 3-wire, grounding type

30 amp
125-volt, 2-pole, 3-wire, grounding type

50 amp
125 / 250-volt, 3-pole, 4-wire, grounding type

Figure 7.9.3. Configurations for grounding-type receptacles and attachment plug caps used for recreational vehicle supply cords and recreational vehicle lots.

bossed brass, stainless steel, anodized or alclad aluminum not less than 0.020 inch thick, or other approved material (e.g., 0.005 inch plastic laminates), which reads, as appropriate, either:

a. “This connection is for 110–125 volt AC, 60 Hz (Cycles) service. Do not connect to higher voltage” or

b. “This connection is for 3-wire 120/240 volt AC, 60 Hz (Cycles),—ampere service.”

7.9.5 Location. The point of entrance of a power-supply assembly shall be located within twenty-five feet (25’) of the rear, on the left (road) side or at the rear, left of the longitudinal center of the vehicle, within eighteen inches (18”) of the outside wall.

Exception: A trailer having a gross vehicle weight rating of 1,500 pounds or less, a motor home, or a truck camper shall be permitted to have the electrical point of entrance located on either side provided the main drain outlet is located on the same side.
7.10 Wiring Methods.

7.10.1 Electrical metallic tubing, flexible metal conduit, metal-clad cable, and nonmetallic sheathed cables with a grounding conductor, shall terminate by means of fittings, clamps or connectors approved for the purpose. The use of flexible metal conduit shall be permitted as a grounding means where both the conduit and the fittings are approved for the purpose.

7.10.2 Rigid metal conduit shall be provided with a locknut inside and outside the box, and a conduit bushing shall be used on the inside. Inside ends of the conduit shall be reamed.

7.10.3 Nonmetallic outlet boxes shall be acceptable only with non-metallic sheathed cable.

7.10.4 In walls and ceilings constructed of wood or other combustible material, outlet boxes and fittings shall be flush with the finished surface or project therefrom.

7.10.5 Wall and ceiling outlets shall be mounted in accordance with Article 370 of the National Electrical Code (NFPA No. 70-1974; ANSI CI — 1974).

Exception: Snap-in type boxes or boxes provided with special wall or ceiling brackets that securely fasten boxes in walls or ceiling may be used.

7.10.6 The sheath of nonmetallic cable or the armor of metal-clad cable shall be continuous between outlet boxes and other enclosures.

7.10.7 Metal-clad and nonmetallic cables shall be permitted to pass through the centers of the wide side of 2-inch by 4-inch studs. However, they shall be protected where they pass through 2-inch by 2-inch studs or at other studs or frames where the cable would be less than 1 1/2 inches from the inside or outside surface. Steel plates on each side of the cable, or a steel tube, with not less than No. 16 MSG wall thickness shall be required to protect the cable. These plates or tubes shall be securely held in place.

7.10.8 No bend shall have a radius of less than five times the cable diameter.

7.10.9 When connected with cable connectors or clamps, cables shall be supported within twelve inches (12") of outlet boxes, distribution panelboards, and splice boxes on appliances. Supports shall be provided every four and one-half feet (4 1/2') at other places.
Exception: Where approved devices of insulating materials are employed with a loop of extra cable to permit future replacement of the device, the cable loop shall be considered as an integral portion of the device.

7.10.10 Nonmetallic sheathed cables shall be supported within eight inches (8") of a nonmetallic outlet box without cable clamps.

7.10.11 Where subject to physical damage, exposed nonmetallic cable shall be protected by covering boards, guard strips, or conduit. Cables likely to be damaged by stowage shall be so protected in all cases.

7.10.12 Metallic face plates shall be of ferrous metal not less than 0.030 inch in thickness or of nonferrous metal not less than 0.040 inch in thickness. Nonmetallic face plates shall be of the listed or approved type.

7.10.13 Where metallic face plates are used they shall be effectively grounded.

7.10.14 Where outdoor or under-chassis wiring is 115-volt (nominal) or over and is exposed to moisture or physical damage, the wiring shall be protected by rigid metal conduit, or by electrical metallic tubing that is closely routed against frames and equipment enclosures. The conductors shall be suitable for wet location.

7.11 Conductors and Outlet Boxes.

7.11.1 The maximum number of conductors permitted in outlet and junction boxes shall be in accordance with Section 370-6 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).

Exception: Outlet boxes of dimensions less than those required in Table 370-6(a)(1) and Table 370-6(a)(2) of the National Electrical Code shall be permitted provided the box has been tested and approved for the purpose.

7.11.2 At least four inches (4") of free conductors, measured from the face of the outlet box, shall be left at each outlet box except where conductors are intended to loop without joints.

7.12 Grounded Conductors. The identification of grounded conductors shall be in accordance with Section 200-6 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).

7.13 Connection of Terminals and Splices. Conductor splices
and connections at terminals shall be in accordance with Section 110-14 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974). If splices of the grounding wire in nonmetallic-sheathed cable are made in outlet boxes, the splices shall be insulated.

7.14 Switches. Switches shall be rated as follows:

7.14.1 For lighting circuits, switches shall be rated not less than 10 amperes, 120-125 volts and in no case less than the connected load.

7.14.2 For motors or other loads, switches shall have ampere or horsepower ratings, or both, adequate for loads controlled. (An “AC general-use” snap switch may control a motor 2 horsepower or less with full-load current not over 80 per cent of the switch ampere rating.)

7.15 Receptacles. All receptacle outlets shall be: (a) of the grounding type; and (b) installed in accordance with Sections 210-21 and 210-22 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).

7.16 Lighting Fixtures.

7.16.1 General. Any combustible wall or ceiling finish exposed between the edge of a fixture canopy, or pan and the outlet box, shall be covered with noncombustible material of either metal equal to the thickness of the fixture or asbestos of one-sixteenth inch (1/64”).

7.16.2 Shower Fixtures. If a lighting fixture is provided over a bathtub or in a shower stall, it shall be of the enclosed and gasketed type and approved for the type of installation. The switch for shower lighting fixtures and exhaust fans, located over a tub or in a shower stall, shall be located outside the tub or shower space.

7.16.3 Outdoor Outlets, Fixtures, Air-Cooling Equipment, etc. Outdoor fixtures and other equipment shall be approved for outdoor use.

7.17 Grounding. (See also Section 7.19 on Bonding of Non-current-Carrying Metal Parts.)

7.17.1 Power-Supply Grounding. The grounding conductor in the supply cord or feeder shall be connected to the grounding bus or other approved grounding means in the distribution panelboard.
7.17.2 Distribution Panelboard. The distribution panelboard shall have a grounding bus with sufficient terminals for all grounding conductors or other approved grounding means.

7.17.3 Insulated Neutral.

a. The grounding circuit conductor (neutral) shall be insulated from the equipment grounding conductors and from equipment enclosures and other grounded parts. The grounded (neutral) circuit terminals in the distribution panelboard and in ranges, clothes dryers, counter-mounted cooking units, and wall-mounted ovens shall be insulated from the equipment enclosure. Bonding screws, straps or buses in the distribution panelboard or in appliances shall be removed and discarded.

b. Connection of electrical ranges and electrical clothes dryers utilizing a grounded (neutral) conductor, if cord connected, shall be made with 4-conductor cord and 3-pole, 4-wire grounding-type plug caps and receptacles.

7.18 Interior Equipment Grounding.

7.18.1 In the electrical system, all exposed parts, metal enclosures, frames, lighting fixture canopies, etc., shall be effectively bonded to the grounding terminals or enclosure of the distribution panelboard.

7.18.2 Bare wires, green-colored wires, or green wires with yellow stripe(s) shall be used for equipment grounding conductors only.

7.18.3 Where grounding of electrical equipment is specified, it shall be accomplished as follows:

a. Connection by metallic raceway (conduit or electrical metallic tubing) or the sheath of metal-clad cable to metallic outlet boxes.

b. A connection between the one or more grounding conductors and a metallic box by means of a grounding screw, which shall be used for no other purpose, or an approved grounding device.

c. The grounding wire in nonmetallic sheathed cable may be secured under a screw threaded into the fixture canopy other than a mounting screw or cover screw; or may be attached to an approved grounding means (plate) in a nonmetallic outlet box for fixture mounting (grounding means may also be used for fixture attachment screws).

7.18.4 A connection between the one or more grounding con-
ductors brought into a nonmetallic outlet box shall be so arranged that a connection can be made to any fitting or device in that box that requires grounding.

7.18.5 Where more than one equipment grounding conductor of a branch circuit enters a box, all such conductors shall be in good electrical contact with each other, and the arrangement shall be such that the disconnection or removal of a receptacle, fixture, or other device fed from the box will not interfere with or interrupt the grounding continuity.

7.18.6 Cord-connected appliances, such as washing machines, clothes dryers, refrigerators, and the electrical system of gas ranges, etc., shall be grounded by means of an approved cord with grounding conductor and grounding type attachment plug.

7.19 Bonding of Noncurrent-Carrying Metal Parts.

7.19.1 All exposed noncurrent-carrying metal parts that may become energized shall be effectively bonded to the grounding terminal or enclosure of the distribution panelboard.

7.19.2 A bonding conductor shall be connected between any distribution panelboard and an accessible terminal on the chassis.

Exception: Any recreational vehicle which employs a unitized metal chassis-frame construction to which the distribution panelboard is securely fastened with a bolt(s) and nut(s) or by welding or riveting is considered to be bonded.

7.19.3 Grounding terminals shall be of the solderless type and listed as pressure terminal connectors recognized for the wire size used. The bonding conductor shall be solid or stranded, insulated or bare, and shall be No. 8 AWG copper minimum, or equal.

7.19.4 The metallic roof and exterior coverings shall be considered bonded if:

a. The metal panels overlap one another and are securely attached to the wood or metal frame parts by metallic fasteners, and

b. The lower panel of the metallic exterior covering is secured by metallic fasteners at each cross member of the chassis, or the lower panel is bonded to the chassis by a metal strap.

7.19.5 The gas, water and waste pipes shall be considered grounded if they are bonded to the chassis.

Notes: See Paragraph 7.19.2 for chassis bonding.

7.19.6 Furnace and metallic circulating air ducts shall be bonded.
7.20 Appliance Accessibility. Every appliance shall be accessible for inspection, service, repair, and replacement without removal of permanent construction.

8. Painting of Wiring

8.1 During painting or staining of the recreational vehicle, it shall be acceptable to paint metal raceways (except where grounding continuity would be reduced) or the sheath of the nonmetallic cable. Some arrangement, however, must be made so that no paint shall be applied to the individual wires, as color coding may be obliterated by the paint.

9. Polarization

9.1 The white conductors shall be employed for grounded circuit conductors only and shall be connected to the white terminal or lead on receptacle outlets and fixtures. It shall be the unswitched wire in switched circuits.

Exception: A cable containing a white conductor may be used for single-pole, three-way or four-way switch loops where the connections are made so that other than the white conductor is the return conductor from the switch to the outlet. Painting of the terminal end of the wire is not required in such cases.

9.2 If the white conductor of a cable is used for other than grounded conductors or for other than switch loops, as explained in 9.1 (for a 230-volt circuit for example), the conductor shall be finished in a color other than white at each outlet where the conductors are visible and accessible.

10. Connection of Terminals and Splices.

10.1 Terminals. Connection of conductors to terminal parts shall ensure a thoroughly good connection without damaging the conductors and shall be made by means of pressure connectors (including set screw type), solder lugs, or splices to flexible leads, except that No. 8 or smaller solid conductors and No. 10 or smaller stranded conductors shall be permitted when connected by means of wire-binding screws or studs and nuts having upturned lugs, or the equivalent. Terminals for more than one conductor and terminals used to connect aluminum shall be of a type suitable for the purpose.
10.2 Splices. Conductors shall be spliced or joined with splicing devices suitable for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices, and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device suitable for the purpose.

11. Factory Tests (Electrical)

11.1 Electrical Factory Tests. Each recreational vehicle shall be subjected to the following tests:

11.1.1 General. Each recreational vehicle shall be subjected to: (1) a continuity test to assure that all metallic parts are properly bonded, (2) operational tests to demonstrate that all equipment is properly connected and in working order, and (3) polarity checks to determine that connections have been properly made.

11.1.2 Circuits of 115 volts or 115/230 Volts. Each recreational vehicle designed with a 115 volt or 115/230 volt electrical system shall withstand the applied potential without electrical breakdown of a one-minute 900-volt dielectric strength test, or a one-second 1,080-volt dielectric strength test, with all switches closed, between current-carrying conductors, including neutral, and the recreational vehicle ground. During the test, all switches and other controls shall be in the “on” position. Fixtures and permanently installed appliances shall not be required to withstand this test.

11.1.3 Low-Voltage Circuits. Low-voltage circuit conductors in each recreational vehicle shall withstand the applied potential without electrical breakdown of a one-minute, 500-volt or a one-second, 600-volt dielectric strength test. The potential shall be applied between live and grounded conductors. The test shall be permitted on running light circuits before the lights are installed provided the vehicle’s outer covering and interior cabinetry has been secured. The braking circuit shall be permitted to be tested before being connected to the brakes provided the wiring has been completely secured.

12. Examination of Equipment for Safety

12.1 The examination or inspection of equipment for safety, according to the recommendations contained in this Standard, shall be conducted under uniform conditions and by organizations properly equipped and qualified for experimental testing, inspections of the run of goods at factories, and service-value determinations through field examinations.
Chapter 1 Scope

1-1 General. The intent of this Standard is to provide minimum construction requirements and the use of land areas designated for Recreational Vehicle Parks. While such Parks are designed primarily for use by recreational vehicles, this Standard also recognizes that some provide facilities for campers using tents and sleeping bags.

NOTE: There are several types of Recreational Vehicle Parks commonly referred to as “Overnight Parks,” “Destination Parks,” “Primitive Parks,” or “Campgrounds.” This Standard includes requirements applicable, in varying degrees, to all types. “Overnight Parks” are intended to serve recreational vehicle owners who use the facilities for only a few nights on the way to some other destinations. They normally provide water, sewer, and electrical park services. “Destination Parks” are intended to serve recreational vehicle owners who use the facilities for more extended stays of several days or weeks. Besides water, sewer, and electrical park services, this type Park normally offers laundry facilities, recreational equipment, and entertainment programs. “Primitive Parks” are largely unimproved land areas dedicated to outdoor camping and offer only sanitary (toilet) facilities. “Campgrounds” have publicly available campsites under the control of the operator to accommodate a camping unit or units for those desiring to rent the space.

This Standard covers only construction and fixed land-use requirements. Operational practices and the maintenance of recreational vehicle parks are not included.


1-3 Applicability. This Standard has been developed to serve as the basis for regulations by local authorities to cover the construction of new recreational vehicle parks and the use of land areas designated for such use. The criteria are considered minimum good practices. It is recommended that existing recreational vehicle parks comply with the provisions of this Standard as feasible.
Chapter 2 Definitions

2-1 Approved: Means acceptable to the authority having jurisdiction.

2-2 Authority Having Jurisdiction: The organization, office or individual responsible for "approving" equipment, an installation, or a procedure.

2-3 Offset (Sewer Lines): An offset in a line of piping is a combination of elbows or bends which brings one section of the pipe out of line but into a line parallel with the other section.

2-4 Public Water Supply: A municipally or privately owned approved community water supply, which is distributed to consumers through a public water supply system.

2-5 Recreational Vehicle: A vehicular type unit primarily designed as temporary living quarters for recreational, camping, or travel use, which either has its own motive power or is mounted on or drawn by another vehicle. The basic entities are: travel trailer, camping trailer, truck camper and motor home.

2-6 Recreational Vehicle Park: A plot of land upon which two or more recreational vehicle sites are located, established or maintained for occupancy by recreational vehicles of the general public as temporary living quarters for recreation or vacation purposes.

2-7 Recreational Vehicle Site: A plot of ground within a recreational vehicle park intended for the accommodation of either a recreational vehicle, tent, or other individual camping unit on a temporary basis.

2-8 Recreational Vehicle Stand: That area of a recreational vehicle site intended for the placement of a recreational vehicle.

2-9 Sewage: Any liquid waste containing animal or vegetable matter in suspension or solution or the water-carried wastes resulting from the discharge of water closets, laundry tubs, washing machines, sinks, dishwashers, or any other source of water-carried waste of human origin or containing putrescible material.

2-10 Sewer Main: That portion of a sewer system which receives the discharge from all sewer laterals or branches within the recreational vehicle park.

2-11 Sewer Branch: That portion of a sewer system which receives the discharge from more than one sewer lateral.
2-12 Sewer Lateral: That portion of a sewer system which serves as a single site, stand or building.

2-13 Waste Disposal Station: A facility provided for the emptying of the waste holding tanks of recreational vehicles.

2-14 Water Riser Pipe: That portion of the water connection serving the recreational vehicle site which extends from the water supply main through a lateral branch and terminates at a water connection.

2-15 Watering Station: A facility for supplying potable water to the water storage tanks of recreational vehicles.

Chapter 3 General

3-1 Park Density. Each recreational vehicle site shall be at least 900 square feet in area and the average park density shall not exceed 30 recreational vehicle sites per acre.

3-2 Surface Runoff Water. Provision shall be made for draining surface water so as to prevent accumulation of stagnant water.

3-3 Park Design and Construction.

3-3.1 Buildings. Every building in a recreational vehicle park shall be designed and constructed in accordance with applicable building codes.

3-3.2 Roads. Minimum widths of recreational vehicle park roads shall be 10 feet per traffic lane or parallel parking lane.
3-3.2.1 Roads shall be readily traversable with a well-drained surface.

3-3.2.2 Road curves shall have a minimum internal radius of 40 feet.

3-3.2.3 Turnarounds shall be provided for all dead-end roads over 100 feet in length and shall have a minimum exterior radius of 50 feet.

3-3.3 Playground Equipment. When provided, playground equipment shall be structurally sound and designed for safety.

3-4 Swimming and Bathing Facilities. If provided, such facilities shall be designed in accordance with the requirements of the authority having jurisdiction, or, in the absence of such, with the Recommended Practice for the Design, Equipment and Operation of Swimming Pools and Other Public Bathing Places, current edition, published by the American Public Health Association.

3-5 Recreational Vehicle Stand Construction.

3-5.1 Each recreational vehicle stand shall be designed and constructed at such elevation, distance and angle with respect to its access to provide for safe and efficient placement and removal of recreational vehicles.

3-5.2 Each recreational vehicle stand shall be constructed to minimize the development of ruts or low spots by the vehicle tires.

3-5.3 Each recreational vehicle stand shall be graded to provide drainage but shall not exceed 2 inches per 10 feet across the width of the stand.
Chapter 4 Environmental Health and Sanitation

4-1 Potable Water Supply and Distribution.

4-1.1 Quality. The supply or supplies of water shall comply with the appropriate potable water standards of the state or local health authority or, in the absence thereof, with the Drinking Water Standards of the Federal Environmental Protection Agency (See Part 72 of Title 42 of the Code of Federal Regulations).

4-1.2 Sources. Only water from approved sources shall be used. Where an approved public water supply system is available, it shall be used. Where the park has its own water supply system, the components of the system shall be approved. A water supply system which is used on a seasonal basis shall be provided with means for draining or shall be protected from freezing.

4-1.3 Prohibited Connections. The potable water supply shall not be connected to any nonpotable or unapproved water supply, nor be subject to any backflow or back siphonage.

4-1.4 Supply. The water supply system shall be designed and constructed in accordance with the following:

(a) A minimum of 25 gallons per day per site for sites without individual water connections.

(b) A minimum of 50 gallons per day per site for sites with individual water connections.

(c) A minimum of 50 gallons per day per site if water-flush closets are provided in toilet and shower buildings.

4-1.5 Pressure and Volume. Where water is distributed under pressure, the water supply system shall be designed to provide a minimum flow pressure of 20 pounds-per-square-inch with a minimum flow of 1 gallon-per-minute at any outlet. The maximum pressure in the system shall not exceed 100 pounds-per-square-inch.

4-1.6 Outlets. Water outlets shall be convenient of access and, when not piped to individual recreational vehicle sites, shall not be located farther than 300 feet from any site. Provisions shall be made to prevent accumulations of standing water or the creation of muddy conditions at each water outlet.

4-1.7 Storage Tanks. Water storage tanks shall be constructed of impervious materials, protected against contamination, and provided with locked, watertight covers. Any overflow or ventilation openings shall be downfacing and provided with cor-
rosion-resistant screening of not less than number 24 mesh to prevent the entrance of insects and vermin. Water storage tanks shall not have direct connections to sewers.

4-1.8 Wells, Springs and Similar Sources.

4-1.8.1 All wells, springs and similar sources of water intended for potable purposes shall be properly constructed, located and protected to exclude surface contamination and to minimize the potential of contamination from sanitary hazards.

4-1.8.2 A well equipped with a hand pump shall be protected by a concrete apron surrounding the pump suction pipe to divert wastewater away from the well.

4-1.8.3 Hand pumps, when provided, shall be so designed and installed that all openings into the interior of the pump are protected so as to exclude contamination. Open pitcher pumps shall not be used. Each hand pump shall be bolted to a mounting flange securely fastened to the well casing. The top of the casing shall extend at least 1 inch above the face of the flange.

4-1.9 Connections At Individual Recreational Vehicle Stands.

4-1.9.1 When provided, the water connections for potable water piped to individual recreational vehicle stands shall be located within 2 feet of a point on the road (left) side of the recreational vehicle when parked on site, 9 feet from the center line of the recreational vehicle stand and 20 feet from the rear of the stand.

4-1.9.2 Each water connection shall consist of a water riser pipe which shall be equipped with a ¾-inch valved outlet with a threaded male spigot for the attachment of a standard water hose.

4-1.10 Drinking Fountains. If provided, drinking fountains shall be in conformance with American National Standard Z4.2.

4-2 Sanitary Conveniences.

4-2.1 General. All plumbing shall be installed in accordance with the plumbing codes of the authority having jurisdiction and with this Standard.

4-2.2 Toilet and Shower Facilities.

4-2.2.1 Toilets and urinals shall be provided at one or more locations in every recreational vehicle park. They shall be con-
4-2.2.2 Every toilet building shall have a minimum ceiling height of 7 feet.

4-2.2.3 If facilities for both males and females are housed within the same structure, they shall be separated and appropriately marked.

4-2.2.4 Unless artificial light is provided, the total window or skylight area shall be equal to at least 10 percent of the floor area.

4-2.2.5 Unless provided with an approved mechanical ventilation system, every toilet room shall have permanent, non-closable, screened opening(s) having a total area not less than 5 percent of the floor area opening directly to the exterior in order to provide proper ventilation. Listed exhaust fan(s), vented to the exterior, the rating of which in cubic feet per minute is at least 25 percent of the total volume of the toilet room(s) served, shall be considered as meeting the requirements of this subsection.

4-2.2.6 All openable windows and vents to the outside shall be provided with fly-proof screens of not less than number 16 mesh.

4-2.2.7 All doors to the exterior shall open outward, be self-closing, and shall be screened by means of a vestibule or wall to prevent direct view of the interior when the exterior doors are open. Such screening shall not be required on single unit toilet buildings.

4-2.2.8 The interior finish of walls shall be moisture-resistant to a height of four feet to facilitate washing and cleaning.

4-2.2.9 The floors shall be constructed of material impervious to water and be easily cleanable. Any toilet building having flush-type toilets shall be provided with a floor drain in the toilet room.

4-2.3 Number, Location and Arrangement of Toilets, Urinals and Lavatories.

4-2.3.1 A minimum of 4 toilets shall be provided for the first 29 recreational vehicle sites. For each additional 25 recreational vehicle sites not provided with sewer connections, an additional toilet shall be provided.

4-2.3.2 If water-flush toilets are provided, an equal number of lavatories shall be provided for up to 6 toilets. One addi-
ional lavatory shall be provided for each 2 toilets when more than 6 toilets are required. Each lavatory basin shall have a piped supply of potable water and shall drain into the sewage system.

4-2.3.3 If separate facilities are provided for men and women, urinals shall be acceptable for no more than one-third of the toilets required in the men’s facilities, except that one urinal may be used to replace a toilet in a minimum park. Only individual stall or wall-hung types of urinals shall be acceptable. Floor type trough units shall be prohibited.

4-2.3.4 Toilets shall be of an approved type and shall be provided with seats with open fronts.

4-2.3.5 Each toilet shall be in a separate compartment and be provided with a door with a latch for privacy and a holder or dispenser for toilet paper. Dividing walls or partitions shall be at least 5 feet high and shall be separated from the floor by a space not greater than 12 inches.

4-2.3.6 Toilet compartments shall not be less than 30 inches in width, and there shall be not less than 30 inches of clear space in front of each toilet.

4-2.3.7 Each female toilet room shall be provided with a receptacle for sanitary napkins. The receptacle shall be of durable, nonpervious and readily cleanable material, and shall be provided with a lid.

4-2.4 Showers.

4-2.4.1 Shower stalls, if provided, shall be of the individual type, be screened from view, and be not less than 30 inches by 30 inches in area. Each stall shall be designed to minimize the flow of water into the dressing compartment, and shall be properly connected to the sewerage system by means of a trapped inlet.

4-2.4.2 Each individual shower shall be provided with an individual dressing compartment with minimum floor dimension 30 inches by 30 inches which is screened from view and equipped with clothing hooks and a stool or bench.

4-2.4.3 The floors of showers and dressing compartments shall have an impervious skid-resistant surface. Wooden racks (duck boards) over shower floors are not acceptable.

4-2.4.4 Open showers provided exclusively for the removal of sand, etc., following beach activities, and whereunder
bathing attire is not removed, need not comply with the provisions of this Subsection.

4-3 Sewerage Facilities.

4-3.1 Approval and Sewerage Disposal Facilities. The sewerage disposal system shall be approved. Parks shall be connected to a public sewer system if such is available within 200 feet of the boundary of the park and the connection may lawfully be made thereto. Storm water sewers shall be separate and apart from any sewers intended for the conveyance of sanitary sewage.

4-3.2 Pipe Materials, Sizes and Installation.

4-3.2.1 Pipe material for sewers shall be as accepted or specified by the authority having jurisdiction.

4-3.2.2 The minimum diameters of sewer laterals, branches and mains serving recreational vehicle stands shall be in accordance with the following table:

<table>
<thead>
<tr>
<th>Maximum Number of Recreational Vehicle Stands Served</th>
<th>Minimum Pipe Sizes (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3 or 4</td>
</tr>
<tr>
<td>36</td>
<td>4</td>
</tr>
<tr>
<td>71</td>
<td>5</td>
</tr>
<tr>
<td>120</td>
<td>6</td>
</tr>
<tr>
<td>440</td>
<td>8</td>
</tr>
</tbody>
</table>

4-3.2.3 The sewer lines shall be located to prevent damage from vehicular traffic and frost heaving.

4-3.2.4 All sewer line joints and sewer connections shall be watertight.

4-3.2.5 Cleanouts shall be provided at the upper terminal of each sewer main or branch, and at intervals not exceeding 200 feet along any straight run or portion thereof.

4-3.2.6 Every change in alignment or grade in excess of $22\frac{1}{2}$ degrees shall be served by a cleanout except that a cleanout shall not be required for a single 45 degree bend or a single offset which comprises two 45 degree bends.
4-3.2.7 Approved manholes may be used in lieu of clean-outs and shall not be spaced more than 400 feet apart.

4-3.2.8 Horizontal-to-horizontal changes in direction shall be made with 45 degree “Y” branches, combination “Y” and ⅝th bend branches, or other approved fittings of equivalent sweep.

4-3.3 Connections for Individual Recreational Vehicle Stands.

4-3.3.1 When provided, the sewer connections for individual recreational vehicle stands shall be located so as to minimize damage by the parking of recreational vehicles or automobiles.

4-3.3.2 The connection shall be located within 2 feet of a point on the road (left) side of the recreational vehicle when parked on the site, 9 feet from the center line of the recreational vehicle stand and 10 feet from the rear of the stand. Figure A-1 shows a typical arrangement.

4-3.3.3 The connection shall consist of a sewer riser extending vertically to grade. The minimum diameter of the sewer riser pipe shall be 3 inches and it shall be provided with a 4-inch inlet.

4-3.3.4 The sewer riser pipe shall be firmly imbedded in the ground and be protected against damage from heaving or shifting, and the entrance of surface water. It shall be provided with a tight-fitting plug or cap which shall be secured by a durable chain (or equivalent) to prevent loss.

4-3.4 Recreational Vehicle Waste Disposal Stations.

4-3.4.1 One recreational vehicle waste disposal station shall be provided for each 100 recreational vehicle stands, or part thereof, which are not equipped with individual sewer connections.

4-3.4.2 Each station shall be level, convenient of access from the service road, and shall provide easy ingress and egress for recreational vehicles.

4-3.4.3 Construction of Waste Disposal Stations.

(a) Unless other approved means are used, each station shall have a concrete slab with drain inlet located so as to be on the road (left) side of the recreational vehicle.

(b) The slab shall be not less than 3 feet by 3 feet, at least 5 inches thick and properly reinforced, the surface of which is
trowelled to a smooth finish and sloped from each side inward to a sewer inlet.

(c) The sewer inlet shall consist of a 4-inch, self-closing foot-operated hatch of approved material with cover milled to fit tight. The hatch body shall be set in the concrete of the slab with the lip of the opening flush with its surface to facilitate the cleansing of the slab with water. The hatch shall be properly connected to a sewer inlet which shall discharge to an approved sanitary sewage disposal facility constructed in accordance with 4-3.5.

4-3.4.4 Flushing Facilities.

(a) If the recreational vehicle park is provided with a piped water supply system, means for flushing the recreational vehicle holding tank and the slab shall be provided. It shall consist of a piped supply of water under pressure, terminating in a valved outlet located and installed as to minimize damage by automobiles or recreational vehicles. The flushing device shall consist of a properly supported riser terminating at least 2 feet above the ground surface, with a \( \frac{3}{4} \)-inch valved outlet to which is screwed a flexible hose.

(b) The water supply to the flushing device shall be protected from backflow by means of a listed vacuum breaker located downstream from the last shutoff valve.

(c) Adjacent to the flushing arrangement there shall be posted a sign of durable material, not less than 2 feet by 2 feet in size, and inscribed thereon in clearly legible letters shall be: "DANGER — NOT TO BE USED FOR DRINKING OR DOMESTIC PURPOSES."

4-3.5 Recreational Vehicle Watering Stations.

4-3.5.1 A watering station, if provided, for filling recreational vehicle water tanks shall be located at least 50 feet from a waste disposal station. When such is provided, adjacent to the potable water outlet, there shall be posted a sign of durable material, not less than 2 feet by 2 feet in size, and inscribed thereon in clearly legible letters shall be: "POTABLE WATER. NOT TO BE USED FOR FLUSHING WASTE TANKS."

4-3.5.2 The potable water shall be protected from backflow by means of a listed vacuum breaker located downstream from the last shutoff valve.

4-4 Refuse Disposal. Facilities for storage, collection and disposal of refuse shall be provided.
Chapter 5 Fuel Gas Systems and Storage of Flammable and Combustible Liquids


Part IVB

Chapter 6 Electrical Systems

6-1 General.

6-1.1 This Chapter covers the installation of electrical equipment used for the supply and control of electrical energy when such equipment is installed in recreational vehicle parks.

6-1.2 This Chapter does not apply to the electrical systems of recreational vehicles or the conductors that connect them to the park electrical supply facilities. (See Standard for Recreational Vehicles, NFPA No. 501C — 1974; ANSI A119.2 — 1974.)

6-1.3 This Chapter is intended to provide identical guidance to that contained in Part B of Article 551 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974). Other applicable portions of the National Electrical Code and the National Electrical Safety Code (ANSI C2 — 1960) shall be followed except as otherwise specified in this Standard. Wherever the provisions of this Chapter differ from the provisions of these Codes, other than Part B of Article 551, the requirements of this Chapter shall apply.

6-1.4 The provisions of this Chapter are not intended to prevent the use of any material, appliance, installation, device, arrangement, or method of construction not specifically prescribed herein, provided any such alternative has been approved or listed. The enforcement authority shall approve such alternate if the material, appliance, installation, device, arrangement or method of construction is at least the equivalent of that prescribed herein, and may require tests or proof of compliance, to be made at the expense of the owner or his agent, to substantiate any claims that may be made regarding the use of any such alternate.

6-2 Definitions of Electrical Terms.

Notes: See Article 100 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974) for additional definitions of electrical terms used herein.

6-2.1 Distribution Panelboard: A single panel or group of panel units designed for assembly in the form of a single panel, including buses, and with or without switches or automatic overcurrent protective devices or both, for the control of light, heat, or power circuits of small individual as well as aggregate capacity; designed to be placed in a cabinet placed in or against a wall or partition and accessible only from the front.
6-2.2 Power Supply Assembly. The conductors, including the grounding conductors, insulated from one another, the connectors, attachment plug caps, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the distribution panelboard within the recreational vehicle.

6-2.3 Recreational Vehicle Site Supply Equipment: The necessary equipment, usually a power outlet, consisting of a circuit breaker or switch and fuse and their accessories, located near the point of entrance of supply conductors to a recreational vehicle site and intended to constitute the disconnecting means for the supply to that site.

6-3. Receptacles.

6-3.1 Type Provided. A minimum of 75 percent of all sites with electrical supply shall each be equipped with a 20-ampere and 30-ampere, 125-volt receptacle conforming to Figure 6-3. The remainder of all sites with electrical supply shall each be equipped with a 20-ampere, 125-volt receptacle conforming to Figure 6-3.

Note: Where the type of site use justifies, special permission may be given to alter the percentage of sites required to be equipped with both 20-ampere and 30-ampere receptacles, as specified herein.

6-3.2 Configurations. Each receptacle to supply electric power to a recreational vehicle shall be of one of the configurations shown in Figure 6-3 in the following ratings:

a. 125/250 volts, 50 amperes, 3-pole, 4-wire, grounding type for 115/230-volt systems.

b. 125 volts, 30-amperes, 2-pole, 3-wire, grounding type for 115-volt systems.

c. 125 volts, 20 amperes, 2-pole, 3-wire, grounding type for 115-volt systems.

Note: Complete details of these configurations can be found in American National Standards C73.17 — 1972; C73.13 — 1972; and C73.12 — 1972.

6-4 Distribution System.

6-4.1 Power Supply. The recreational vehicle park secondary electrical distribution system to recreational vehicle sites shall be derived from single phase, 120/240-volt, 3-wire supply.

6-4.2 Calculated Load.

(a) Electrical service and feeders shall be calculated on the basis of not less than 3,600 watts per site equipped with both 20-
ampere and 30-ampere supply facilities, and 2,400 watts per site equipped with only 20-ampere supply facilities. The demand factors set forth in Table 6-4.2 shall be the minimum allowable demand factors that shall be permitted in calculating load for service and feeders.

Table 6-4.2
Demand Factors for Feeders and Service Entrance Conductors for Park Sites

<table>
<thead>
<tr>
<th>No. of Recreational Vehicle Sites</th>
<th>Demand Factor (percent)</th>
<th>No. of Recreational Vehicle Sites</th>
<th>Demand Factor (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>10-12</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>13-15</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>16-18</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
<td>19-21</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>44</td>
<td>22-40</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>39</td>
<td>41-100</td>
<td>24</td>
</tr>
<tr>
<td>7-9</td>
<td>33</td>
<td>101 and over</td>
<td>23</td>
</tr>
</tbody>
</table>
(b) For the purpose of this Standard, where the park service exceeds 240 volts, transformers and secondary distribution panel-boards shall be treated as services.

(c) The demand factor for a given number of sites shall apply to all sites indicated.

Example: 20 sites calculated at 26 percent of 3,600 watts results in a permissible demand of 936 watts per site or a total of 18,720 watts for 20 sites.

(d) Recreational vehicle site feeder circuit conductors shall have adequate ampacity for the loads supplied, and shall be rated at not less than 30 amperes.

6-4.3 Voltage Drop. The size of the conductors for feeders should be such that the voltage drop for the load (as computed by Section 6-4.2) would not be more than 3 percent for power, heating or lighting loads or combinations thereof, providing further that the maximum total voltage drop for conductors for feeders and branch circuits should not exceed 5 percent over all.

6-4.4 Overcurrent Protection. Overcurrent protection shall be provided in accordance with Article 240 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).

6-4.5 Grounding. All electrical equipment and installations in recreational vehicle parks shall be grounded as required by Article 250 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).

6-5. Recreational Vehicle Site Supply Equipment.

6-5.1 Disconnecting Means. A disconnecting switch or circuit breaker shall be provided in the site supply equipment for disconnecting the power supply to the recreational vehicle.

6-5.2 Access. All site supply equipment shall be accessible by an unobstructed entrance or passageway not less than 2 feet wide and 6½ feet high.

6-5.3 Mounting Height. Site supply equipment shall be located not less than 2 feet nor more than 6½ feet above the ground.

6-5.4 Working Space. Sufficient space shall be provided and maintained above all electrical equipment to permit ready and safe operation, in accordance with Article 110-16 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).
6-6 Grounding Recreational Vehicle Site Supply Equipment.

6-6.1 Exposed noncurrent-carrying metal parts of fixed electrical equipment, such as metal boxes, cabinets and fittings, which are not electrically connected to grounded equipment, shall be grounded by a continuous grounding conductor run with the circuit conductors from the service equipments or from the transformer of a secondary distribution system.

6-6.2 Each secondary distribution system shall be grounded at the transformer.

6-6.3 The neutral conductor shall not be used as an equipment ground for recreational vehicles or equipment within the recreational vehicle park.

6-6.4 No connection to a grounding electrode shall be made to the neutral conductor on the load side of the service disconnecting means or transformer distribution panelboard.

6-7. Protection of Outdoor Equipment.

6-7.1 Wet Locations. All switches, circuit breakers, receptacles, control equipment and metering devices, located in wet places or outside of a building, shall be rainproof equipment.

6-7.2 Meters. If secondary meters are installed, meter sockets without meters installed shall be blanked off with an approved blanking plate.

6-8 Overhead Conductors.

6-8.1 Minimum Vertical Clearance for Wire. Open conductors of not over 600 volts shall have a vertical clearance of not less than 18 feet in all areas subject to recreational vehicle movement. In all other areas, vertical clearances shall conform to Article 730-18 of the National Electrical Code (NFPA No. 70 — 1974; ANSI Cl — 1974).


6-8.2 Horizontal Clearance. The horizontal clearance from structures and recreational vehicles for overhead conductors shall be not less than 3 feet for 600 volts or less.

6-9 Underground Service, Feeder, Branch Circuit and Recreational Vehicle Site Feeder Circuit Conductors.
6-9.1 General. All direct-burial conductors, including the equipment grounding conductor if of aluminum, shall be insulated and specifically approved for the purpose. All conductors shall be continuous from fitting to fitting. All splices shall be made in approved junction boxes.

Note: See Section 310-6 and Article 339 of the National Electrical Code (NFPA No. 70 — 1974; ANSI CI — 1974) for conductors or Type UF cable used underground or in direct burial in earth.
Chapter 7 Fire Safety

7-1 General Park Fire Safety.

7-1.1 Fire Protection Equipment. Fire extinguishers, hoses, or other fire fighting equipment shall be readily available, conspicuously marked and strategically located for the protection of park buildings and grounds, and shall be in working condition at all times.

7-1.1.1 Portable fire extinguishers provided by the park operator shall be of the multipurpose, dry chemical type. It is recommended that such extinguishers have a minimum rating of 2A:20B:C as defined in the Standard for the Installation of Portable Fire Extinguishers (NFPA No. 10–1973; ANSI Z112.1–1973).

7-2 Outdoor Fires and Fire Locations. Designated outdoor fire locations, if provided, shall be in safe and convenient areas where they will not constitute fire hazards to vegetation, undergrowth, trees, and recreational vehicles.

7-3 Posting of Regulations. Appropriate regulations for the prevention of fire shall be posted in conspicuous locations.

7-4 Fire Emergency Planning. An emergency plan shall be arranged with the nearest fire fighting unit, civil defense organization, or local fire warden or marshal for assistance in handling any fire emergency and such plan shall be posted.