U.S. Department of Housing and Urban Development

Special Attention of:
Field Office
Director of Housing
Director of Housing Management
Field Office, Chief Property Officers

Transmittal for Handbook No.: 4910.1
1994 Edition

Issued: July 29, 2003

Revised page 6-15 of Handbook 4910.1, Minimum Property Standards for Housing, 1994 Edition.

2. Summary:

A. Revision to paragraph 614-1 restores the height requirement for the elevator door back to 7'-0". The current 7'-8" height requirement represents an undocumented change from the previous height requirement of 7'-0", recorded in previous editions of the MPS, and is not reflected in any of the four model building codes: neither the BOCA National Building Code, nor the International Building Code, nor the Standard Building Code, nor the Uniform Building Code. When dealing with required elevator door sizes to accommodate ambulance stretchers, the Standard and Uniform codes specify only a door width, but not a door height. The required width of 3'-6" in these 2 codes is consistent with the MPS. The other 2 codes, the BOCA and International, have no door size requirements. The elimination of the 7'-8" height requirement would bring the MPS into conformance to the model building codes and restore the previous agreement with the standard door height of 7'-0" used by the elevator industry.

3. Filing Instructions:

REMOVE:	INSERT:
Handbook 4910.1, 1994 Edition Page 6-15, dated 1994	Handbook 4910.1, 1994 Edition Page 6-15, dated 3/02

U.S. Department of Housing and Urban Development

Special Attention of:
Field Office
Director of Housing
Director of Housing Management
Field Office, Chief Property Officers

Transmittal for Handbook No.: 4910.1
1994 Edition

Issued: July 29, 1994

---

1. This Transmits
Revisions to HUD Handbook 4910.1, Minimum Property Standards for Housing, 1994 Edition.

2. Significant Changes:
The handbook has been revised to incorporate existing policy and

procedures which are the result of change in policy, regulation or stature. In addition, many of the reference standards have been updated to reflect current construction products in use today.

Chapter 1 - Introduction

Chapter 1 provides a statement of policy that requires the use of this handbook under specific programs administered by the Department. This chapter also relates to the requirements for multi-family and care type housing as well as housing for the elderly. In addition, requirements for accessibility for the physically handicapped have been added in this chapter to comply with the requirements of the fair housing act.

Chapter 2 - General Acceptable Criteria

Chapter 2 deals with criteria for the property, i.e. streets, utilities and access.

Chapter 3 - Site Design

Chapter 3 cover the requirements for on site design that relates to the building design, location on the property, ground water, yards, grading, walks, parking etc.

Chapter 4 - Building Design

Chapter 4 deals with the building design. It covers such items as space planning, access, circulation, stairs, elevators, ventilation etc.

Chapter 5 - Materials

Chapter 5 illustrates the kind and quality of materials acceptable to ensure durability, economy, resistance to weather and moisture, corrosion and fire etc.

Chapter 6 - Construction

Chapter 6 deals with the requirements for the building construction from the site development to the actual materials used for construction. It also includes such items as elevators, water and sewer supply, various mechanical items, including energy and swimming pools.

The Appendices, "A" through "K" are a part of this MPS and are intended to be used accordingly.

Appendix - A - Represents definitions of various terms used throughout the text of the MPS.

Appendix - B - Represents an updated listing of acronyms and organizations or terms used in the MPS.

Appendix - C - Represents an updated listing of acceptable materials reference standards.

Appendix - D - Represents test procedures and performance criteria considered acceptable for testing various construction materials.

Appendix - E - Represents an updated lists of acceptable engineering practice standards.

Appendix - F - Represents a listing of Use of Material bulletins on products that HUD engineers have investigated and found their performance to be acceptable.

Appendix - G - Represents "SI" (Metric) conversion units.

Appendix - H - Is a current listing of various organizations that develop and make available material standards that are referenced in the MPS.

Appendix - I - Represents rules to be followed for HUD programs for Multi-Family and Care type housing projects where local or model codes are used for construction.

Appendix - J - Represents model code provisions to be used in conjunction with an area code having a partially accepted code.

Appendix - K - Represents rules to be followed for HUD programs for One and Two Family housing projects where local or model codes are used. Updates HUD flood hazard exposures to conform with FEMA requirements under the National Flood Insurance Program.

---

3. Effective Date:

These changes became effective Dec. 15, 1993.

4. Filing Instructions:

REMOVE	INSERT
Handbook 4910.1, 1984 edition with changes	Handbook 4910.1 1994 Edition

Nicolas P. Retsinas
Assistant Secretary for Housing
- Federal Housing Commissioner

Property

Standards

for

Housing

1994 Edition

GRAPHICS MATERIAL IN ORIGINAL DOCUMENT OMITTED

MINIMUM PROPERTY STANDARDS FOR HOUSING

4910.1

U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Office of Assistant Secretary for Housing
- Federal Housing Commissioner
Washington, DC

1994 Edition

GENERAL TABLE OF CONTENTS

Page numbers of the MPS indicate the chapter first and the page within the chapter second. Appendices are similarly numbered.

FOREWORD

These Minimum Property Standards reference nationally recognized model building codes for concerns relating to health and safety. Locally adopted building codes can be used for the same purpose when they are found acceptable by the HUD Field Office.

These standards establish the acceptability of properties for mortgage insurance, and will further the goal of a decent and a suitable living environment for every American family. These standards will protect the Department's interest by requiring certain features of design and construction which are not normally required by state and local codes. These requirements will insure the durability of the project for the life of the mortgage.

Nicolas P. Retsinas
Assistant Secretary for Housing
- Federal Housing Commissioner

Introductory Statement

These Minimum Property Standards (MPS) are intended to provide a sound technical basis for the construction of housing under the numerous programs of the Department of Housing and Urban Development. MPS Handbook 4910.1 was originally published for multifamily housing with each page marked MF. The Handbook applies to all types of housing. Chapters 1 thru 6 and Appendices A thru J apply to only multifamily and care-type housing. Appendix K applies to property which is not multifamily or care-type housing. The standards describe those characteristics in a property which will provide present and continuing utility, durability, and economy of maintenance.

The MPS for Housing (4910.1) are intended to be used in all jurisdictions. In areas where the Department has found the local code acceptable, these MPS are to be used in conjunction with the local code. In areas where the Department has not accepted the local building code, these MPS are to be used in conjunction with a nationally recognized model building code designated by the Department.

Finally, in areas where the Department has partially accepted a local building code, the MPS are to be used in conjunction with the local building code plus those portions of a nationally recognized model code designated by the Department.

The requirements contained in this handbook and in the indicated codes define the minimum level of quality acceptable to HUD. Other factors and considerations affect the level of quality of the property. The level of quality will be considered by the Department during the valuation process. Procedures for evaluation of design considerations, project eligibility and valuation analysis are set forth in HUD program handbooks and other applicable Federal and local regulations and standards.

Environmental quality is also a relevant consideration. As a general policy, development of all properties must be consistent with the national program for conservation of energy and other

natural resources, and care must be exercised to avoid air, water, land and noise pollution and other hazards to the environment. Orderly and efficient development responsive to residential needs, preservation of good existing natural surroundings, conservation of fossil fuels, and careful consideration of environmental factors are essential for the furtherance of this policy.

TABLE OF CONTENTS

4910.1

CHAPTER 1

GENERAL USE

100 APPLICATION

100-1 PROPOSED CONSTRUCTION

General

These Minimum Property Standards apply to buildings and sites designed and used for normal multifamily and care-type occupancy, including both unsubsidized and subsidized insured housing. The requirement of compliance with these standards under specific programs administered by the Department is prescribed in program regulations promulgated by the Department. Generally, these standards regulate the nature and quality of the property within its property lines. However, some standards require certain off-site conditions. See, for example, 204-1, which requires street access to the property.

100-2 HOUSING FOR THE ELDERLY

This Section includes Uniform Federal Accessibility Standards (UFAS) at 24 CFR Part 40, Appendix A and variations, additions and exceptions to the MPS for the above types of housing, when housing is to be for the elderly.

The number of accessible housing units which must be built will be determined on a project-by-project basis in accordance with the requirements of the program under which the project is to be built. Accessible housing units shall also meet all the facility accessibility requirements of UFAS.

100-2.1 Handrails

Handrails for exterior steps not attached to dwellings shall be provided in accordance with UFAS on both sides of a tenant stairway with a flight rise exceeding 24" and width exceeding 4 ft., and on one side when the width is 4 ft. or less.

100-2.2 Walks

Walks designed for use by tenants shall have maximum gradients of five percent.

100-2.3 Community Social Rooms

Community social rooms are required in housing for the elderly.

100-2.4 Optional Project Facilities

Where the following facilities are provided, they shall comply with the following:

(a) Occupational or Physical Therapy - Space shall be provided for services and for storage of equipment.

(b) Dietitian's Office - When a dietitian is to be employed, suitable office space convenient to the kitchen shall be provided.

(c) First Aid or Health Room - These facilities and any accompanying infirmary shall be designed for observation, minor treatment, or short term care of project residents. When these services are provided, facilities for an attending nurse are

required.

(d) Nursing Facilities - These facilities for either short-term or long-term care for project residents shall be as follows:

(1) If nursing facilities are not provided at the time of construction, residential units may be specially designed for conversion to nursing facilities at a later date.

(2) Facilities shall be grouped in a separate wing, floor or auxiliary building.

(3) The nursing unit and patient rooms shall comply with requirements of UFAS.

100-2 HOUSING FOR THE ELDERLY - Continued

(4) The nursing portion of the project shall be clearly incidental to the purpose of providing housing, and the ratio of nursing beds to living units shall not exceed 1 to 4.

(e) Medical Facilities - Where a doctor's office with examination and treatment rooms is provided, it shall be designed to serve project residents. Spaces provided for rental to doctors, dentists, oculists, opticians, etc., shall be within the limits of allowable commercial space and located so as not to interfere with the residential space.

(f) Central Dining - Where mandated by the program requirements, space shall be provided for meals.

(g) Central Kitchen Facilities - The kitchen shall be arranged and equipped for adequate and efficient: food storage; preparation in proper sequence; serving; dish and utensil cleaning and storage; and refuse storage and removal. In projects consisting of 20 or more living units, the dishwashing activity shall be separated from that of food preparation. All cabinets and equipment provided shall be designed and installed to prevent contamination by insects, rodents, other vermin, splash, dust and overhead leakage.

(h) Central Bathing Facilities - Such facilities shall be located on the same floor and close to the living units served.

When provided, a central bathroom shall contain:

(1) Space for dressing and the movement of wheelchairs provided in accordance with the requirements of UFAS, Section 4.

100-2 HOUSING FOR THE ELDERLY - Continued

(2) Adequate lavatories and compartmented water closets. Enclosure of water closets is not required when the water closet is within a room used by only one bather. Designs in which a bather must enter the public corridor to reach a water closet are not acceptable.

100-2.5 Bedrooms

a. Beds shall be accessible from two sides and one end.

b. Combined living-sleeping space shall be of sufficient size to accommodate the living and sleeping functions as conveniently as separate living and sleeping areas.

100-2.6 Bathrooms

a. Bathtubs shall be provided with grab bars as specified in Section 4.26 of the UFAS.

b. A stall shower, when installed, shall meet the requirements of the UFAS Section 4.21, Shower Stalls.

c. Tub or shower bottom surfaces shall be slip resistant.

d. Grab bars and shower seats shall be installed to sustain a dead weight of 250 pounds for 5 minutes and comply with UFAS.

100-2.7 Halls and Corridors

a. Minimum clear widths of public halls and corridors shall be 5'-0".

b. Handrails complying with UFAS shall be provided on at least one side of all tenant corridors, except in living units.

100-2 HOUSING FOR THE ELDERLY - Continued

100-2.8 Stairs

The maximum riser height for stairs is 7".

100-2.9 Elevators

a. Elevators complying with UFAS shall be provided in buildings of three or more stories; or two stories if any accessible living unit is located on a floor which does not have all common facilities.

b. At least one elevator car in each building shall be suitable for handling ambulance stretchers and have a minimum capacity of 2500 lbs. and minimum size as required for service elevator under 614-1.

100-2.10 Emergency Lighting

Emergency lighting shall be provided for every public space, corridor, stairway, elevator and other means of egress. The lighting shall provide a minimum of 1 footcandle measured at the floor.

100-2.11 Flame Spread

The flame spread rating of walls and ceiling shall not exceed 75.

100-2.12 Wall Finishes

Abrasive wall finishes such as a sand finish shall not be used.

100-2.13 Floors

a. Floors shall be slip-resistant.

b. Adjacent dissimilar materials shall be flush with each other to provide an unbroken surface. Thresholds and Expansion Joint covers shall be flush with the floor.

100-2 HOUSING FOR THE ELDERLY - Continued

100-2.14 Heat Loss Calculations

The inside design temperature shall not be less than 75 F in all habitable rooms and corridors when the outside temperature is at design level. Lower inside design temperatures may be used for storage rooms, work rooms, offices and other similar spaces.

100-2.15 Hot Water and Steam Heating Systems

Heating systems serving 10 or more living units shall be supplied by not less than two properly parallel connected boilers. The minimum net capacity of each boiler shall be 70% of the total connected load when two boilers are used and 35% when three boilers are used. When four or more boilers are used, the total capacity of all boilers shall not be less than the total connected load, and each boiler shall have the same net capacity. When the property contains nursing facilities, 1 1/2 beds shall be considered the equivalent of one living unit for purposes of this requirement.

100-2.16 Hot and cold water shall be supplied to all plumbing fixtures except water closets, urinals, bedpan washers, and drinking fountains, each of which will be supplied with cold water only.

100-2.17 Automatic temperature limit controls shall be provided so that hot water for showers will not exceed 110 F.

100-2.18 The quantity of hot water for personal use and the capacity of the domestic hot water heating equipment system shall be in compliance with the design criteria of ASHRAE Systems Handbook, 1980, Chapter "Service Water Heating."

100-2 HOUSING FOR THE ELDERLY - Continued

100-2.19 Night Light

A convenience outlet for receiving a night light shall be provided approximately 2 ft. above the floor between the bed location and the bathroom.

100-2.20 Emergency Call Systems

In projects containing 20 or more living units, each bathroom and one bed location in each living unit shall be furnished with one of the following emergency call systems: an emergency call system which registers a call

(annunciator and alarm) at one or more central supervised locations, an intercommunicating telephone system connected to a switchboard which is monitored 24 hrs a day, or an emergency call system which sounds an alarm (not the fire alarm) in the immediate corridor and automatically actuates a visual signal in the corridor at the living unit entrance.

100-3 REQUIREMENTS FOR ACCESSIBILITY TO PHYSICALLY DISABLED PEOPLE

All multifamily dwellings covered by the Fair Housing Amendments Act of 1988, for first occupancy after March 13, 1991 must be designed and constructed to have at least one building entrance on an accessible route and shall be designed and constructed in such a manner that:

100-3.1 The public and common use areas are readily accessible to and usable by disabled persons;

100-3.2 All the doors designed to allow passage into and within all premises are sufficiently wide to allow passage by disabled persons in wheelchairs; and

100-3.3 All premises within covered multifamily dwelling units contain the following features of adaptable design:

a. An accessible route into and through the covered dwelling unit;

100-3 REQUIREMENTS FOR ACCESSIBILITY TO PHYSICALLY DISABLED PEOPLE - Continued

b. Light switches, electrical outlets, thermostats and other environmental controls in accessible locations;

c. Reinforcements in bathroom walls to allow later installation of grab bars around the toilet, tub shower, stall and shower seat, where such facilities are provided; and

d. Usable kitchens and bathrooms such that an individual in a wheelchair can maneuver about the space.

100-3.4 One method of compliance with these requirements is satisfactory compliance with the Fair Housing Accessibility Guidelines 24 CFR Ch.I, Subch. A. App. II and III.

100-3.5 For multifamily dwelling covered by this section see 24 CFR 100.201.

100-4 REQUIREMENTS FOR CARE TYPE FACILITIES

100-4.1 Construction

Care Type Facilities shall comply with requirements of The Guidelines for Construction and Equipment of Hospitals and Medical Facilities as published by the AIA press, 1987 edition.

100-4.2 Housing Units and Patient Rooms

At least 50 percent of living units, patient rooms or bedrooms and associated facilities shall comply with the requirements of UFAS.

100-5 REHABILITATION CONSTRUCTION

Rehabilitation construction includes the following categories: (1) all repairs to or replacement of present elements of an existing building, such as windows, stairs, flooring, or wiring; (2) rearrangement of rooms by the relocation of partitions or by the installation of

100-5 REHABILITATION CONSTRUCTION - Continued

new bathrooms and kitchens; or (3) the general replacement of the interior of a building. This may or may not include changes to structural elements such as floor systems, columns or load bearing interior or exterior walls. Rehabilitation construction shall comply with the standards for new construction and with the provisions of the program handbook for the particular program. New construction on cleared or vacant land or additions to an existing building which enlarge the floor area or height of the building shall meet the standards for new construction.

101 VARIATIONS TO STANDARDS

101-1 NEW MATERIALS AND TECHNOLOGIES

These standards are intended to encourage the use of new or innovative technologies, methods and materials. See Subchapter 613 of this handbook. Alternatives and non-conventional or innovative methods and materials shall be equivalent to these standards in the areas of quality, durability, economy of maintenance, operation and usability.

101-2 SPECIAL CONDITIONS

Certain conditions in the geographic area or on the site may justify modification of specific standards, or make compliance with the standards impracticable or impossible. In these cases, variations in accordance with procedures given in 101-3 may be permitted.

101-3 VARIATION PROCEDURES

101-3.1 Variations from the requirements of any standard with which the Department requires compliance shall be made in the following ways:

a. For a particular design or construction proposed to be used on a non-repetitive basis for a specific case or project, the decision is the responsibility of the Field Office. Headquarters concurrence is not required.

b. Where a variation is intended to be on a repetitive basis, a recommendation for a Local Acceptable Standard, substantiating data, and background information shall be submitted by the Field Office to the Headquarters Office responsible for the Minimum Property Standards.

101-3.2 Variations which require individual analysis and decision in each instance are not considered as repetitive variations even though one particular standard is repeatedly the subject of variation. Such variations are covered by the subject of Section 101-3.1a.

102 LOCAL CODES AND REGULATIONS

102-1 CODES AS STANDARDS

Acceptability of new construction for insurance or for utilization in other programs administered by the Department requires, among other things, compliance with minimum health and safety criteria. The Minimum Property Standards for Housing consist of the standards contained in and referenced by this handbook and the codes and standards with which compliance is required by 24 CFR 200.925 and .926. The relevant portions of 24 CFR 200.925 and .926 are reproduced in Appendix I and K of this handbook.

102-1.1 COMPLIANCE WITH CODES

The Department of Housing and Urban Development does not assume responsibility for enforcing or determining compliance with local codes and regulations or for making interpretations regarding their application for purposes of the local government. However, if compliance with the provisions of a local code is required in accordance with 24 CFR 200.925 or .926, then the Department is responsible for determining compliance and issuing interpretations for the Department's purposes.

103 REFERENCED STANDARDS

These standards must be used in conjunction with the information or requirements listed in Appendices A through I, which are incorporated herein by reference. Compliance with these standards and the requirements in the appendices does not obviate the need for compliance with any other applicable Federal, State or local requirements.

TABLE OF CONTENTS

4910.1

CHAPTER 2

GENERAL ACCEPTABILITY CRITERIA

200 GENERAL

These general acceptability criteria apply to existing as well as new construction.

201 REAL ESTATE ENTITY

The project site shall comprise a single plot, except that two or more parcels separated by other parcels or a street or streets may be acceptable provided the resulting parcels comprise a readily marketable real estate entity. In either case, the property shall be sufficiently grouped to assure that convenient and efficient management during operation can be expected.

202 SERVICES AND FACILITIES

202-1 TRESPASS

The property shall be so designed that it can be used and maintained without trespass upon adjoining properties.

202-2 UTILITIES

Utilities and other facilities shall be independent for the property, without dependence upon other properties.

203 SITE CONDITIONS

HAZARDS

The property shall be free of those hazards which may adversely affect the health and safety of the occupants or the structural soundness of the improvements or which may impair the customary use and enjoyment of the property. These hazards include toxic chemicals, radioactive materials, other pollution, hazardous activities, subsidence, flood, erosion, expansive or compressible soils, inadequate drainage outfall, landslides or mudflows, and deposition of suspended solids or others located on or off site. Projects with potentially significant hazards may be acceptable if any such hazards are effectively mitigated.

203 SITE CONDITIONS - Continued

203-2 UNFORESEEN CONDITIONS

When special conditions exist or arise during construction which were unforeseen and which necessitate precautionary measures, the HUD Field Office may require such corrective work as may be necessary to meet the special conditions. Special conditions include rock formations, unstable soil, high groundwater level and springs.

204 ACCESS

204-1 STREETS

Each property shall be provided with vehicular access by an abutting public or private street. Private streets shall be protected by a permanent easement.

204-2 ACCESS TO THE BUILDING AND THE NONDWELLING FACILITIES

204-2.1 Each building shall have safe and convenient pedestrian access from project parking areas.

204-2.2 Each building shall have convenient access for service and, when necessary, for delivery of fuel.

TABLE OF CONTENTS

CHAPTER 3

SITE DESIGN

300 GENERAL

300-1 DESIGN

A site design shall be provided which includes all site facilities necessary to create a safe, functional, convenient, healthful, durable and energy efficient living environment for residents. The site design shall include an arrangement of the site facilities which accomplishes these purposes.

301 THE PROPOSED SITE

301-1 TOPOGRAPHY

In the design of a site, the effect of topographic conditions on the costs of development and operation shall be considered when locating various uses on the

land. Land uses shall be combined with site conditions in a manner which assures a functional and economical maintainable development and in a manner which permits correction of potential hazards.

301-2 GROUND WATER

Buildings, structures, streets, paved areas and utilities shall be located on the site in areas of the least ground water hazard.

302 LAND USE

302-1 GENERAL

Site conditions shall be considered in land use planning for multifamily housing.

302-2 NOISE CONTROL

Through the use of site design techniques such as building location and orientation, window placement and the use of barriers, predictable undesirable site noise shall be moderated to meet the requirements of 24 CFR Part 51, Environmental Criteria and Standards.

303 LOTS, YARDS AND BUILDING SETBACK DISTANCE

303-1 GENERAL

The length and height of each building wall, the location of the main entrance as it relates to the dwellings and to window walls of nearby dwellings and the location or windows in all habitable rooms shall be considered in establishing yard depth.

303-2 BUILDING PARKING SETBACK DISTANCE

Buildings with grade level or low windows shall be set back from parking areas and shall be arranged to prevent direct or concentrated discharge of automobile exhausts into any window.

304 PARKING AREAS

Adequate parking space shall be provided for residents, guests and service vehicles. Where practical, additional parking space shall be planned and reserved for future use.

305 WALKS

Walks shall be provided for safe convenient access to all dwellings and for safe pedestrian circulation throughout the development between facilities and locations where a significant need for pedestrian access can be anticipated.

306 GRADING DESIGN

Site grading design shall accomplish the following:

a. Allow drainage of surface water away from buildings and off-site;

b. Minimize earth settlement problems;

c. Avoid concentrating runoff onto neighboring properties where erosion or other damage would be caused;

d. Minimize erosion;

e. Minimize potential earth movement problems which might adversely affect completed construction.

TABLE OF CONTENTS

4910.1

CHAPTER 4

BUILDING DESIGN

400 GENERAL

400-1 BUILDING DESIGN

Building design shall provide for ease of circulation and housekeeping, visual and auditory privacy, accident protection, accessory services and economy in maintenance and use of space.

401 SPACE PLANNING

401-1 NON-RESIDENTIAL SPACES

Management and maintenance space shall be provided commensurate with the number of living units served. Also, space shall be provided for necessary staff where social services are provided.

401-2 BATHS

401-2.1 Every living unit shall be provided with a water closet, lavatory and a bathtub or shower.

401-2.2 Shower compartment floors and walls shall be finished

with a wear resistant and non-absorbent surface to a height of not less than 6 ft. above the floor.

402 ACCESS AND CIRCULATION

402-1 DOORS AND OPENINGS

402-1.1 Living Unit Doors

Living unit entrance doors shall be side-hinged doors not less than 3 ft. in width and 6 ft. 8 in. in height.

402-1.1 Living Unit Doors - Continued

402-1.2 Locking devices at doors and windows shall be as follows:

a. Each exterior doorway and each doorway leading to garage areas, common hallways, terraces, balconies, or other areas affording easy access to the premises shall be protected by a door which, if not a sliding door, shall be equipped with a deadlock using either an interlocking vertical bolt and striker, a minimum of 1.2 in. throw dead bolt or a minimum 1/2 in. throw self-locking dead latch. Locks shall not require the use of a key for operation from the inside.

b. All sliding doors, first floor and basement windows and windows opening onto stairways, fire escapes, porches, terraces, balconies or other areas affording easy access to the premises shall be equipped with a locking device. A sliding door used as a main or service entrance shall be equipped with a keyed locking device.

402-2 HANDRAILS AND RAILINGS

Required railings shall have a minimum height of 36 in. and balusters shall be designed to prevent the passage of a spherical object having a diameter of 6 in.

402-3 ELEVATORS

402-3.1 Service Required

a. Elevators shall be provided in buildings of:

(1) Five or more stories;

(2) Four stories where deemed necessary by the HUD Field Office to satisfy market

considerations;

402.3-2 Service or Combination Elevators

In elevator type buildings, at least one of the elevators shall have a minimum capacity of 2500 lbs and minimum size as required for service elevators under 614-1.

403 VENTILATION

403-1 CRAWL AND ATTIC SPACE

403-1.1 Crawl Space

a. The space between the bottom of the floor joists and the earth under any building (except such space as is occupied by a basement or cellar) shall be provided with a sufficient number of ventilating openings through foundation walls or exterior walls to ensure ample ventilation. Such openings shall be covered with a corrosion-resistant wire mesh with a mesh size not greater than 1/2 in. nor less than 1/4 in. in any dimension. The minimum net area of ventilating openings shall not be less than 1 sq. ft. for each 150 sq. ft. of crawl space area.

403-1.1 Crawl Space - Continued

One ventilating opening shall be within 3 ft. of each corner of each building where such openings are required.

Exceptions: (1) Ventilation openings may be vented to the interior of buildings where warranted by climatic conditions; and

(2) The total area of ventilation openings may be reduced to 1/1500 of the under floor area where the ground surface is treated with an acceptable vapor retarder material, and one such ventilation opening is within 3 ft. of each corner of said building. The vents may have operable louvers.

b. The under floor grade shall be cleaned of all vegetation and organic material.

403-1.2 Attic Space

a. Cross ventilation shall be provided for each separate space. Ventilation openings shall be protected against the entrance of rain and snow.

b. The ratio of the total net free ventilation area to the area of ceiling shall be not less than 1/150, except that the ratio may be 1/300 if:

(1) A vapor retarder having a transmission rate not exceeding one perm is installed on the warm side of the ceiling;

(2) Between 25 and 50 percent of the required ventilating area is provided by vents located in the eaves or cornices with the balance of the required ventilation provided by ventilators located at least 3'-0" above the vents in the eaves or cornices; or

(3) The attic space is accessible and suitable for future habitable rooms or walled-off storage spaces have at least 50% of the required ventilating area located in the upper part of the ventilated spaces as near the high point of the roof as practicable and above the probable level of any future ceiling.

TABLE OF CONTENTS

4910.1

CHAPTER 5

MATERIALS

500 GENERAL

500-1 MATERIALS

Materials installed shall be of such kind and quality to ensure that the dwelling will provide acceptable durability, economy of maintenance and adequate resistance to weather, moisture, corrosion and fire. The local HUD Field Office may request evidence of a material's compliance with the requirements of the structure's plans and specifications and these MPS. Product labels are considered acceptable evidence.

507 THERMAL AND MOISTURE PROTECTION

507-1 BUILDING INSULATION

Materials used for insulation shall be of proven effectiveness and adequate durability so as to ensure that required design specifications concerning heat transmission, sound control and fire rating are attained. Insulation in contact with the ground shall be installed so as not to be adversely affected by soil, vermin and water.

507-2 CAULKING AND JOINT SEALANTS

Materials used for caulking and sealants shall be suitable for the use intended, and shall be compatible with the materials to which they are applied and with any finish that may be applied over them.

508 DOORS, WINDOWS, GLAZING PANELS

508-1 PERFORMANCE TESTING

All windows and sliding glass doors shall be tested for air infiltration, water penetration and physical loading as set forth in Appendix D. The test unit shall be either the largest size marketed by the manufacturer or the size designated in the referenced standard. All windows and sliding glass doors shall meet or exceed the minimum performance levels set forth in Appendix D.

508-2 METAL DOORS AND FRAMES

508-2.1 Steel Doors

a. Each interior and exterior steel door shall bear the manufacturer's certification that the product complies with the applicable standard.

b. Each steel sliding glass door unit shall bear a label that identifies the manufacturer, certifies compliance with the tests required in Appendix D, identifies the certifying organization, and states the maximum size of the unit tested.

508-2.2 Aluminum Doors

Each aluminum sliding glass door and aluminum storm door shall bear the label of an independent inspection agency. The label shall identify the manufacturer by name or symbol, and shall certify compliance with the applicable

standard.

508-3 WOOD DOORS

508-3.1 Materials

a. Doors may be complete manufactured units or stock doors and frames. Job-built wood frames may be used.

b. Entrance doors shall be of exterior type as defined in the applicable referenced standard and not less than 1-3/4 in. thick. Service doors (where temperature is near the same on both sides) may be 1-3/8 in. thick. Exterior door frames shall be treated against decay.

c. Interior hinged doors shall be not less than 1-3/8 in. thick. Closet doors may be 1-1/8 in thick, provided that warp does not exceed 1/4 in.

508-4 METAL WINDOWS

508-4.1 General

Where metal windows or sliding glass doors are used in areas subject to a winter design temperature of 100 degree F or lower, insulating frames shall be provided. These

windows or doors shall comply with AAMA 1503.1-88, Condensation Resistance of Windows, Doors and Glazed Wall Sections. Where wood is to be used as the insulator, it shall be treated with a water repellent preservative. Storm sash are acceptable to serve this purpose if a thermal separation is provided between the prime and the storm window, where both window frames are metal.

508-4.2 Steel Windows

Steel windows shall bear a label that identifies the manufacturer, certifies compliance with the tests required in Section 508-1, identifies the certifying organization, and states the maximum size of the unit tested.

508-4.3 Aluminum Windows

Aluminum windows shall bear the label of an independent inspection agency. The label shall identify the manufacturer by name or symbol, and shall certify compliance with the applicable standard.

508-5 WOOD WINDOWS

508-5.1 Operating Wood Windows

Operating windows shall be manufactured units consisting of the frame, sill, sash, weatherstripping and operating hardware. Job site assembled windows composed of frames and sashes made by different manufacturers are not acceptable.

Each operating wood window unit shall bear the label of an independent inspection agency. The label shall identify the manufacturer by name or symbol and shall certify compliance with the applicable standard.

508-5.2 Fixed Sash Windows

Fixed sash windows such as picture windows and bay windows, may be manufactured, job-built or job assembled units.

508-6 HARDWARE

508-6.1 Hardware shall comply with Section 402-1.2. Locks shall meet or exceed the performance criteria of ANSI A156.2-89 for the series and grades as follows:

4910.1

a. Building entrance doors serving more than two families, series 4000, grade 1.

b. Living unit entrance doors and building entrance doors serving one or two families, series 4000, grade 2.

c. Doors within living units, series 4000, grade 3.

The performance criteria are contained in Sections 7, 8, and 9 of ANSI A156.2-89. Evidence of conformance shall be provided to the HUD Field Office upon request.

Three butt hinges shall be used on all exterior doors.

508-6.2 Labeling

Locks shall be labeled as complying with the performance criteria of the applicable series and grade of ANSI A156.2-89. This information shall appear on the lock, in the installation instructions or on the packing box.

509 FINISH MATERIALS

509-1 EXTERIOR WALL FINISHES

a. Each bundle of shingles or shakes shall bear a label identifying its grade and species, and certifying compliance with the applicable commercial standard.

b. Each panel or package of hardboard shall bear a label identifying the specific type of hardboard and the manufacturer, and certifying compliance with the applicable standard.

c. Hardboard products shall be manufactured in accordance with the standards listed in Appendix C. Other hardboard products are considered special products and may be used in accordance with the procedures set forth in Paragraph 513.

509-2 FINISH FLOORING, RIGID

a. Each bundle or package of wood flooring shall bear a label identifying grade and species.

b. Ceramic tile shall be identified as required by the applicable referenced standard.

509-3 FINISHED FLOORING, RESILIENT

The thickness of resilient flooring may be less than required by the referenced standards in Appendix C, but no less than the thickness shown in Table 5-9.1.

TABLE 5-9.1

MINIMUM RESILIENT FLOORING THICKNESS (Links to 49101c05.pdf)

509-4 CARPETS AND MATS

Carpet cushions shall comply with the requirements of UM 72-80. Carpets shall comply with the requirements of UM 44C-78.

509-5 PAINTING

509-5.1 Lead Content

No paint shall contain more than 0.06 percent lead by weight calculated as lead metal in the total nonvolatile content of liquid paints or in the dried film of paint already applied.

509-5.2 Suitability

If a paint to be used on exterior surfaces is not inherently mold resistant, a suitable fungicide shall be included in the formulation.

513 SPECIAL CONSTRUCTION MATERIALS

513-1 DEFINITION

Special or alternate construction materials and products are those which are new or are not covered by specific requirements in these standards or in the referenced standards in Appendices C, E & F.

513-2 USAGE

Special or alternate materials and products may be used as prescribed in Section 101-1 and in HUD Handbook 4950.1 Technical Suitability of Products Program, Technical and Processing Procedures.

513-3 REQUIREMENTS FOR ACCEPTANCE

Special or alternate materials and products will be accepted for use in multifamily structures in accordance with the procedures set forth in HUD Handbook 4950.1.

TABLE OF CONTENTS

CHAPTER 6

CONSTRUCTION

600 GENERAL

All work shall be performed in a workmanlike manner and in accordance with good usage and accepted practices. All materials shall be made and installed so they perform in accordance with their intended purposes.

602 SITE

602-1 SITE UTILITIES - UNDERGROUND UTILITIES

602-1.1 Underground piping and related items shall be protected from corrosion. Underground mechanical and electrical systems shall be protectively coated to minimize corrosion where soil conditions warrant. Where applicable, sacrificial anodes may be used.

602-1.2 Sacrificial anodes may be used where soil resistivity does not exceed 15,000 ohm - centimeters. Otherwise, an impressed current system of corrosion prevention shall be used.

602-2 ROADS AND WALKS

602-2.1 GENERAL

Surfaces and base courses for roads, streets, parking areas and walks shall be durable materials. Their construction shall be in conformance with generally accepted local design practices.

602-2.2 Drainage

Adequate surface and underground drainage systems shall serve all paving and improvements so as to ensure continuing stable soil support for these improvements.

603 CONCRETE

603-1 INTERIOR CONCRETE SLABS-ON-GROUND

603-1.1 General

Slabs shall be designed and constructed in accordance with ACI 302.1R-80, Guide for Concrete Floor and Slab Construction, and as may be necessary to prevent slab damage due to potential soil movements.

603-1.2 Vapor retarders and base course shall be provided for all interior concrete slabs to which a finish flooring is applied. In arid regions where irrigation and heavy sprinkling is not done, and where no drainage or soil problem exists on the site, vapor retarders may be omitted with the consent of the HUD Field Office. Base course may omitted when asphalt tile, rubber tile, vinyl tile, terrazzo and ceramic tile are used as finish flooring, except that base course shall be used when capillarity of subsoil is such that liquid rise from ground water table will permit water to reach the bottom of the slab.

Note: Acceptable base course materials are gravel, slag, crushed rock, sand, cinders and certain types of earth when approved by the local HUD Field Office. See ASTM C-33-90, Table 2. Base course material shall be clean, washed and free from deleterious substances, consistent with ASTM C-33, with 100% of the material passing a 1" sieve and less than 2% passing a #4 sieve.

603-2 EXTERIOR CONCRETE SLABS-ON-GROUND

Slabs shall be designed and constructed in accordance with ACI 302.1R-80, Guide for Concrete Floor and Slab Construction, and as may be necessary to prevent slab damage due to potential soil movements.

606 WOOD

606-1 TERMITE PROTECTION

606-1.1 A chemical barrier must be provided for structures built in those areas where termites are determined by the HUD Field Office to be a hazard. A physical barrier will also satisfy this requirement where the hazard is presented by subterranean termites only.

606-1.2 Soil treatment and pressure treated lumber are chemical barriers.

606-2 DECAY PROTECTION

606-2.1 Protection Against Damage by Decay

Where required by the HUD Field Office, protection against damage by decay shall be provided.

606-3 WOOD CONSTRUCTION

The 1991 Edition of the National Design Specification for Wood Construction shall be used, including the 1991 supplement.

607 THERMAL AND MOISTURE PROTECTION

607-1 ENERGY REQUIREMENTS

607-1.1 Energy Efficiency

All buildings shall be constructed in compliance with the requirements of the CABO Model Energy Code, 1992 Edition except Sections 101.3.1, 101.3.2, 101.3.3 and 502.1.2, but including the Appendix. The values to be used for the table contained in Section 302.1 of the Model Energy Code are to be those for the area in which the building is to be constructed. Information concerning heating and cooling degree days for particular locations shall be obtained from the ASHRAE Handbook of Fundamentals; ASHRAE Heating Cooling Load Calculations Manual; the NAHB-RF Insulation Manual for Homes and Apartments; local utilities; or the National Climatic Data Center Manuals are available from NAHB-RF, or NAIMA.

Other sources of heating degree day and summer cooling data may be used, if acceptable to the HUD Field Office.

607-1.2 Thermal Mass

In addition to the energy criteria set forth in Section 607-1.1, the design of a property may take into consideration the thermal mass of building components. However, thermal mass may be considered only to the extent that the developer or other interested party can

607-1.2 Continued

provide the HUD Field Office with empirical evidence that quantifies the effect of thermal mass with respect to the specific geographical location in question and with

respect to the specific type of construction in question. When the quantifiable effects of thermal mass are considered, the building must provide a level of energy efficiency equal to or exceeding that otherwise required by these MPS.

607-2 FLASHING

General

a. Flashing shall have a service life at least equal to that of the assemblies into which it is built.

b. Alternate products or systems of bitumen-impregnated plastic or elastomeric materials may be used for flashing if they are installed in accordance with the manufacturer's recommendations and are acceptable to the HUD Field Office. Counter flashing is considered exposed flashing and shall be constructed of sheet metal.

c. All openings between wood or metal and masonry shall be caulked with a non-hardening caulking compound.

607-3 GUTTERS AND DOWNSPOUTS

607-3.1 Gutters

a. Gutters shall be provided when either of the following conditions are present:

(1) Soil is of such a nature that excessive erosion or expansion will occur or,

(2) Roof overhangs are less than 12 inches in width for one story structures or less than 24 inches in width for two story structures.

b. When gutters are omitted, a diverter or other suitable means shall be provided to prevent water from roofs or valleys from draining on uncovered entrance platforms or steps.

607-3.1 Continued

c. A gutter having approximately the same cross section as the downspouts shall be used for spacings of up to 40 ft. between downspouts. For each additional 20 ft. of gutter, the gutter width shall be increased by 1 inch.

d. Strainers shall be installed at the head of the downspout when the downspout is connected to an underground drain.

e. Details of any built-in gutters shall be submitted to the HUD Field Office for acceptance.

607-3.2 Scuppers

a. Scuppers shall be installed at the outfall end of a valley for special roof designs, such as "butterfly" roofs.

b. Scuppers shall be installed for overflow of all roofs enclosed by parapet walls, except when the construction of the roof and the type of roof covering used are designed to hold water. Suitable overflow devices shall be used.

607-3.3 Downspouts

Downspouts shall be sized on the basis of 100 square feet of roof surface to 1 square inch of leader. More or less leader area may be required by the HUD Field Office.

608 DOORS, WINDOWS, AND GLAZING

608-1 DOOR PERFORMANCE - GENERAL

Doors shall be durable, installed in good operating condition, free of defects, latch readily and lock securely.

608-2 EXTERIOR DOORS

608-2.1 Weatherstripping

All exterior doors and weatherstripping shall be properly fitted so as to eliminate excessive infiltration of air.

608-2.2 Miscellaneous

A safety door check shall be provided on all outward opening doors, including storm and screen doors.

608-3 WINDOWS

608-3.1 Installation

Windows shall be installed in accordance with the recommendations of the manufacturer. Operating hardware shall be installed. Windows in buildings of 4 or more

stories in height shall be inside glazed or have sash or ventilators that can be glazed from the inside of the building. All glass and glazing beads shall be replaceable.

608-3.2 Weatherstripping

Windows and weatherstripping shall be properly fitted to eliminate excessive infiltration of dust, snow or rain.

608-3.3 Screens

Screens shall be installed on openable windows in habitable rooms and bathrooms.

608-4 GLAZING

608-4.1 Installation Standards

Glazing shall comply with the applicable requirements identified in Appendix E.

609 FINISH MATERIALS

609-1 FINISH FLOORING, RIGID

The products used shall be installed in accordance with the manufacturer's instructions and/or recommendations.

609-2 RESILIENT FLOORING

Resilient flooring shall be installed over a suitable underlayment and in compliance with the recommendations of the manufacturer.

609-3 PAINTING

609-3.1 Application

a. Application of paints, stains, or other coating systems shall be in strict accordance with manufacturer's directions.

b. Additional coats may be required if the finish surface does not provide coverage or hiding that is acceptable to the HUD Field Office.

609-3.2 Exterior Wood Surfaces

Exterior wood surfaces shall be finished as follows:

a. Wood Siding, Millwork and Trim

(1) Knots, resinous wood, and nail holes shall be sealed with a prepared sealer or aluminum paint prior to puttying and priming. Any nail holes or cracks in surfaces to be painted shall be filled with putty.

(2) A prime coat shall be applied to all surfaces to be painted before or immediately after installation. Primer shall be formulated specifically for application to unfinished wood. Finish coats formulated to serve as primers may be used.

(3) One of the following finish systems shall be applied. Coverage shall be that which will provide at least the minimum thickness recommended by the manufacturer.

(a) Oil paint systems.

(b) Latex paint systems.

(c) Pigmented stains as per manufacturer's directions.

(d) Clear penetrating preservatives or water repellent finishing systems.

(4) The top and bottom of exterior wood doors, casement sash, awning sash and the bottom of double hung sash shall receive two coats of paint or sealer.

(5) Prior to erection, all edges of vertical siding shall be sealed with a heavy coat of house paint primer, water repellent stain, exterior aluminum house paint or sealer. Wood batten strips shall be backed-primed or sealed.

b. Wood Shingles, Shakes, Roughsawn Siding.

Two coats of oil stain, pigmented oil stain or an oil shingle paint shall be applied.

c. Hardboard and Softwood Plywood Siding.

These sidings shall be finished in accordance with the manufacturer's direction.

d. Wood Porch Floors and Decks.

One coat of primer and two coats of floor and deck enamel designed for exterior use shall be applied. Joints between floor and wall shall be caulked.

e. Unfinished Surfaces.

Shingles and board siding of vertical grain cedar, redwood and baldcypress may be left unfinished.

609-3.3 Exterior Concrete Masonry Units or Concrete Brick

a. At least two coats of masonry paint shall be applied.

b. Concrete masonry units or concrete brick, except small areas of foundation walls, shall be painted to provide a water resistant finish.

High density concrete brick or solid split block forming the outer face of double unit walls (veneer, cavity walls, etc.) may be left unpainted when acceptable to the HUD Field Office.

609-3.4 Exterior Metal

a. Galvanized Steel or Iron

(1) Field painting shall consist of two coats. One coat shall be a primer formulated specifically for galvanized surfaces, and the second coat shall be a finish coat. A finish coat formulated to serve as a primer may be used as the first coat.

b. Steel, Iron or Terne Plate

(1) Steel or iron, except stainless steel, weathering steels, or steel treated with coatings to provide corrosion resistance, shall be painted.

(2) A rust inhibitive primer and a finish coat shall be applied.

609-3.5 Interior Wood Surfaces

a. Millwork and Trim

(1) All mill work and trim, including windows; interior doors; window, door and base trim; paneling and closet shelving and trim shall be

finished by painting or natural finishing.

(2) Painting

If the surface is open grain wood, it shall be filled or sealed to prevent the grain from rising. Surfaces shall be treated with a primer. One or more finish coats shall be applied to provide a smooth surface and good hiding.

(3) Finished Material

Natural finishes include stain-wax, stain followed by one or more coats of varnish, clear coats of varnish with or without wiped paint undercoats or oil and wax finishes.

4910.1

b. Wood Floors

(1) If flooring is open grain wood, one coat of filler shall be applied. All excess shall be wiped off.

(2) Flooring shall be finished with:

(a) One or two coats of penetrating sealer and one coat of wax; or

(b) Two coats of varnish and one coat of wax; or

(c) Two coats of polyurethane; or

(d) One or more coats of factory-applied finish.

609-3.6 Interior Plaster and Gypsum - Walls and Ceilings

a. Plaster surfaces may be painted, covered or left unfinished, except for surfaces of kitchens and baths. If painted, a finished coat shall be applied over a primer-sealer, unless finish coats are of the self-priming type.

b. Gypsum wallboard shall be covered. If painted, one coat of wallboard sealer shall be applied unless finish coats are of the self-sealing type. Two finish coats shall be applied over the sealer. One finish coat, except in kitchen and baths, may be acceptable if good coverage is obtained.

609-3.7 Interior Metal

Non-ferrous metals or wrought iron may be painted or left unfinished. Other metals shall be painted in accordance with 609-3.4.

609-3.8 Interior Concrete Floors

a. If painted, at least two coats of resin emulsion paint, a solvent rubber paint or a floor and deck enamel shall be applied. If oil paint is used, the surface shall be neutralized before painting.

b. A coat of wax shall be applied over paint, stain or an integral finish.

609-4 WALL COVERINGS

Covering material shall be secured to a suitable base in accordance with the manufacturer's directions.

609-5 OTHER FINISHES

609-5.1 General

Other finishes shall be installed in accordance with the manufacturer's directions.

609-5.2 Carpeting and Cushioning

Carpeting and cushioning shall be installed in accordance with the Specifiers Guide for Contract Carpet Installation, published by the Carpet and Rug Institute. The carpet shall be installed over one of the following suitable underlayments:

a. A finish floor as provided and described in Section 509 and 609;

b. A troweled concrete floor;

c. A plywood subfloor. The top ply of plywood shall be at least "C plugged" grade;

d. A plywood, hardboard or particleboard underlayment over any other subfloor described in this paragraph.

e. Other materials where they provide a smooth, hard, durable surface.

611 EQUIPMENT

611-1 KITCHEN AND VANITY CABINETS

611-1.1 General

a. All manufactured factory finished cabinets shall comply with ANSI A161.1-86, Recommended Minimum Construction and Performance for Kitchen and Vanity Cabinets, or with an equivalent standard.

611-1.1 General - Continued

All cabinets shall bear the label of an independent agency that maintains continuous control over the testing and inspection of the cabinet. The label shall identify the manufacturer's name or symbol and indicate compliance with the applicable standards.

b. Construction and installation of job and custom built cabinets shall be acceptable to the HUD Field Offices. These cabinets shall be equivalent in quality and construction to cabinets meeting ANSI A161.1-86.

611-1.2 Counter Tops

a. The top material shall be securely bonded to a reinforced steel core, to 5/8 in. plywood, or to any other equivalent material.

b. Top material shall be phenolic laminate, vinyl plastic covering, ceramic tile, stainless steel or other material suitable for its intended use. At least a 3 in. back and end splash shall be provided against all abutting vertical surfaces which are not water and grease resistant. When a back splash is omitted, the joints at the juncture of the counter top and vertical surfaces shall be tight and sealed.

c. All edges, including the sink and any built-in surface units, shall have a non-corrodible metal molding or other suitable edging.

Click Here for MS Word Version of Page 6-15 (Links to 49101c6.doc)

613 SPECIAL CONSTRUCTION

613-1 FACTORY-PRODUCED (MODULAR OR PANELIZED) HOUSING

613-1.1 Structural Features

HUD Handbook 4950.1, Technical Suitability of Products Program Processing Procedures, describes procedures to be followed in order to obtain acceptance of structural features of housing not covered by the MPS.

613-1.1 Non-Structural Features

These features include methods of construction, systems, sub-systems, components, materials and processes which are not covered by the MPS. See HUD Handbook 4950.1 for procedures to be followed in order to obtain acceptance of non-structural components or materials.

613-2 SWIMMING POOLS

Where semi-private swimming pools are to be built, their design and construction shall comply with ANSI/NSPI 1-91, American National Standard for Public Swimming Pools.

614 ELEVATORS

614-1 MINIMUM SERVICE ELEVATOR SIZE (Minimum for Ambulance Stretchers) See ANSI A17.1.

Inside car size	-	6'-8" wide by 4'-3" deep
*Door size	-	3'-6" wide by 7'-0" high*
Door type	-	Single slide
Capacity	-	2500 lbs.

615 MECHANICAL

615-1 SPECIAL PIPING SYSTEM

Gas transmission systems shall be installed to obtain at least the level of safety performance required by 49 CFR, Part 192, entitled "Transportation of Natural or Other Gas by Pipeline." Liquid petroleum pipelines shall conform to 49 CFR, Part 195.

615-2 WATER SUPPLY SYSTEM

615-2.1 General

Each living unit shall be provided with a continuing and sufficient supply of safe water under adequate pressure and of appropriate quality for all household uses, and one that will not impair the functioning or durability of the plumbing system or attachments.

615-2.2 Source of Water Supply

a. Whenever feasible, connection shall be made to a publicly owned or publicly controlled water supply system that is adequate to serve the demands of the project.

b. When a public system is not available, connection shall be made to a community system acceptable to the HUD Field Office and approved by the local health authority. The chemical and bacteriological standards of the health authority shall apply. In the absence of such standards, the maximum contaminant levels of the Environmental Protection Agency shall apply.

c. Community water supply systems shall comply with HUD Handbook 4940.2.

615-3 SEWAGE DISPOSAL SYSTEM

615-3.1 General

Each living unit shall be provided with a water-carried system adequate to dispose of domestic wastes in a manner which will not create a nuisance or endanger the health of the occupants or the public.

615-3.2 Method of Sewage Disposal

a. Whenever feasible, connection shall be made to a publicly owned or publicly controlled system that is adequate to serve the needs of the project.

b. When a publicly owned or publicly controlled system is not available or connection to or service therefrom is not feasible, connection shall be made to a community system which complies with HUD Handbook 4940.3 Rev.1-1992 and is acceptable to local regulatory bodies. Evidence of approval by such authorities for each completed system shall be submitted to the HUD Field Office.

APPENDIX A

DEFINITIONS

Abbreviations, terms, phrases and words used in the Minimum Property Standards shall have the meanings given in this Appendix. The following terms are defined for HUD purposes and the definitions may differ from those used in building codes and elsewhere.

COMMUNITY SYSTEM. A state-regulated central utility system owned, operated and maintained by a private corporation or a nonprofit property owner's association.

CONDUCTANCE, THERMAL. The time rate of heat flow through a unit area of a material of a given thickness, per unit of temperature difference. Value is expressed in Btu/(hr x sq ft x F) or w/(m sq x k). (symbol C)

CONDUCTIVITY, THERMAL. The time rate of heat flow through a unit area of a homogenous material under the influence of a unit temperature gradient. Value is expressed in (Btu x in.)/ (hr x sq ft x F) or w/(m x k). (symbol k)

HABITABLE ROOM. A room designed (in accordance with the MPS) and used for living, sleeping, eating or cooking, or any combination thereof. Bathrooms, toilet compartments, closets, halls, storage spaces, laundry and utility rooms, basement recreation rooms and similar areas are not considered habitable rooms.

INDEPENDENT INSPECTION AGENCY. Where the term "independent inspection agency" is used in the standards, the reference is to an agency which maintains a program of continuous control, testing and inspection over the quality of the product. Such an agency must conform to procedures set forth in ANSI Z34.1-87, and shall be acceptable to HUD.

LISTED AND LISTING. Terms referring to materials, equipment or products which have been tested to and comply with an applicable standard and which are shown in a list published by a recognized certifying agency.

LIVING UNIT. A single residential unit providing complete, independent living facilities for one or more persons which includes permanent facilities for living, sleeping, eating, cooking and sanitation.

PERM. The unit of measurement of the water vapor permeability of a material. Value of one perm is equal to one grain of water vapor per square foot per hour per inch of mercury vapor pressure

difference.

PROPERTY. An area of ground under the ownership of a single person or entity including all buildings and improvements thereon.

PUBLIC SPACE. An open space on the premises accessible to a public way or street, such as a yard, court, or open space dedicated to public use and abutting the premises.

PUBLIC SYSTEM. A central utility owned, operated, and maintained by a municipality, county, or other unit of local government having power to tax or levy assessments.

R THERMAL RESISTANCE. A measure of ability to retard heat flow. The reciprocal of thermal conductance: R = 1/C = (hr x sq ft x F) /Btu or (m sq x k)/w.

REQUIRED. Mandatory.

SHALL. Indicates that which is required.

TOILET ROOM. (Half Bath). Enclosed space, containing a watercloset and a lavatory.

U OVERALL COEFFICIENT OF HEAT TRANSMISSION. The combined thermal value of all the materials in a building section, air spaces, and surface air films. U is expressed in Btu/(hr x sq ft x F) or w/(m sq x k).

APPENDIX C

MATERIAL STANDARDS

Materials listed in Appendix C are a partial listing of materials considered to meet the minimum requirements of the MPS. The list of approved incorporations by reference is published in the Code of Federal Regulations at 24 CFR Part 200 Appendix A.

507 THERMAL AND MOISTURE PROTECTION

507-3 BUILDING INSULATION

Cork Board---------- FS HH-I-525A
Cellular Glass---------- FS HH-I-551E
Cellulosic, Vegetable or Wood Fiber------- ASTM C 739-91
Expanded Polystyrene Insulation Board------ FS HH-I-524C
Fiberboard---------- FS LLL-I-535B
Class C or E
or ASTM C 209-84
Insulation Board (Urethane)---------- FS HH-I-530B
Insulation Board, Thermal
(Mineral Aggregate)---------- FS HH-I-529B
or ASTM C 726-88
Insulation Board, Thermal, Faced,
Polyurethane or
Polyisocyanurate--FS HH-I-1972/GEN; 1; 2; 3; 4; 5; & 6
Mineral Fiber, Board (Roof)---------- FS HH-I-526C
Mineral Fiber, Insulation Blanket---------- FS HH-I-521F
Mineral Fiber, Pneumatic or Poured-------- FS HH-I-1030B
Perimeter Insulation---------- FS HH-I-524C
FS HH-I-558B
Form A
Class 1 or 2
Reflective, Thermal---------- FS HH-I-1252B
Cellulosic Fiber Insulating Board---------- PS 57-73
Application of Structural Insulating Board
(Fiberboard) Sheathing---------- ASTM C 846-82
Perlite---------- FSHH-I-574B
or ASTM C 549-81
Vermiculite (used as masonry wall filler)---FS HH-I-585C
Class 2
(for other uses) --- ASTM C 516-85
Spray Applied Cellulosic Thermal Insulation---- UM 80-79

507-6 CAULKING AND SEALANTS

Elastomeric Type; Multi-Compound---------- FS TT-S-227B
Elastomeric Type; Single-Compound---------- FS TT-S-230A
Oil and Resin Base Type---------- FS TT-C-598B
Silicone Rubber Base---------- FS TT-S-001543A

Butyl Rubber Base; Single-Compound------ FS TT-S-001657A
Latex Sealing Compounds------------------- ASTM C 834-91
Voluntary Specifications for Ductile
Back-Bedding Glazing Tapes---------------- AAMA 800-92
Voluntary Specifications for Non-Drying
Sealants for Use with Architectural
Aluminum---------------------------------- AAMA 800-92
Voluntary Specifications for Oil-Extended
Cured Rubber Back-Bedding
Glazing Tapes----------------------------- AAMA 800-92
Celluar Neoprene-------------------------- ASTM C 509-91
Specifications for Dense Rubber-like
Compression Gasket Materials------------ ASTM C 864-90

508 DOORS, WINDOWS, GLAZING PANELS

Metal Doors and Frames

Interior Steel Doors and Frames (flush)-----PS 4-66
1 3/4 in. thick Steel Doors and Frames--- CS 242-62
Aluminum Storm Doors----------- ANSI/AAMA 1102.7-89

Wood Doors and Frames

Hardwood, Hardboard and Plastic Faced Flush
Doors--------------------------- ANSI/NWWMA IS 1-87
Interior Prehung Wood Door Units-------- NSDJA 1-79
Ponderosa Pine Doors------------ ANSI/NWWMA IS 5-73
Douglas Fir, Sitka Spruce and Western Hemlock
Doors----------------------------------- FHDA 7-79
Wood Storm Doors---------------- ANSI/NWWMA IS 6-86
Exterior Wood Door Frames------------------ WM 3-79

Special Doors

Aluminum Prime Windows------------ ANSI/AAMA 101-88
Wood Sliding Patio Doors-------- ANSI/NWWMA IS 3-88

Metal Windows and Frames

Aluminum Prime Windows-------------ANSI/AAMA 101-88
Aluminum Insulating Storm
Products--------------------ANSI/AAMA 1002.10-83
Thermal Transmittance and Condensation
Resistance of Windows, Doors and Glazed
Wall Sections---------------------- AAMA 1503.1-88
Thermal Performance of Residential
Windows and Sliding Glass Doors--------AAMA 1504-88

Wood Windows and Frames

Wood Window Units---------- ANSI/NWWMA IS 2-87

Hardware

Lockset---------- ANSI A156.2-89
Insect Wire Screenings-------- IWS-089 or CS 138-55
Screening, Insect, Non-metallic-------- FS L-S-125B
Insect Screening and Louver Cloth
Woven from Vinyl-Coated Glass
Fiber Yarn---------- ANSI/ASTM D 3656-89

Glass and Other Glazing Panels

Acrylic Plastic Sheets Glazing---------- UM 58a-75
Glass---------- FS DD-G-451D

Safety Standard for Architectural
Glazing Materials---------- CPSC 16 CFR Part 1201

Safety Glazing Material
Used In Buildings-------- SGCC Certified Products Directory

Tempered Glass---------- FS-DD-G-1403B

509 FINISH MATERIALS

509-1 EXTERIOR WALL FINISHES
Aluminum---------- AAMA 1402-86
Fiberboard Shingle Backer---------- ASTM C 208-82 (1982) Class G
Basic Hardboard (Revised 1988)------- ANSI/AHA A135.4-82
Cellulosic Fiberboard---------- ANSI/AHA 1-194.1-95
Hardboard Siding---------- ANSI/AHA 135.6-90
Plywood---------- PS 1-83
Rigid PVC (polyvinyl chloride)---------- ASTM D 3679-92
Textured Plywood Panel Siding---------- UM 64b-75
Stucco (exterior plaster)---------- ASTM C 926-90

509-2 FINISH FLOORING-RIGID

Ceramic Tile---------- ANSI A137.1-88

Specification for Installation
of Ceramic Tile---------- ANSI A108.1A-92
Terrazzo---------- NTMA Specifications, Details and Technical Data - 1990

4910.1

Wood

Block, Slat---------- PS 27-70
Laminated Hardwood Flooring---------- ANSI/HPMA LHF-87
Strip Oak Flooring---------- NOFMA-OFGR/
Vol. 1, No. 1-86 & 89 addendum

509-3 RESILIENT FLOORING
Asphalt Tile (Type I) - Vinyl Tile (Type III)
- Rubber Tile (Type IV)---------- ASTM F 1344-91
Linoleum---------- FS LLL-F-1238A
Rotovinyls (Unfilled Vinyl Sheet)------ FS L-F-001641-71
Backed Vinyl Plastic Sheet
or Tile (Grade C)---------- FS L-F-475A
Homogenous Vinyl Sheet---------- FS L-F-00450A
Underlayment
Basic Hardboard---------- ANSI/AHA A135.4-88
Particleboard (Grade 1-M-1)---------- ANSI A 208.1-89
ASTM D 1037-89
Plywood---------- PS 1-83

511 EQUIPMENT

Minimum Construction Performance
Standards for Kitchen Cabinets-------- ANSI A 161.1-86

515 MECHANICAL

515-7 SPECIAL PIPING SYSTEMS
Gas Piping---------- NFPA 54-92 & 58-92

515-8 WATER SUPPLY SYSTEM
Water Softeners---------- WQA S 100-85
Water Filters---------- WQA S 200-88
Point-of-Use, Low
Pressure Reverse Osmosis
Water System---------- WQA S 300-84
Point-of-Use, Distillation
Drinking Water---------- WQA S 400-86
Community Water Systems
Minimum Design Standards for
Community Water Supply
Systems---------- HUD Handbook 4940.2 8-73

515-9 SEWAGE DISPOSAL SYSTEM
Community Sewage Systems
Minimum Design Standards for
Community Sewage
Systems---------- HUD Handbook 4940.3 Rev. 1-12/92

APPENDIX D

TEST PROCEDURES AND PERFORMANCE CRITERIA

Appendix D is a partial list of the testing procedures and performance criteria required by the Minimum Property Standards.

500 GENERAL

A WALL ASSEMBLIES AND SHEATHING MATERIALS - RESISTANCE TO RACKING

A-1 Test Procedures. Test of Walls shall be conducted in accordance with ASTM E 72-80, "Standard Methods of Conducting Strength Test of Panels for Building Construction." Panel size shall be 8 ft by 8 ft.

A-2 Performance Criteria. The following criteria shall apply:

a. Dry Tests
Load increments------ 400 lb
Maximum load-------- 5200 lb or 0.65 kips/ft
At load of---------- 1200 lb average total deflection 0.20 in.
Residual deflection 0.10 in.
At load of----------2400 lb average total deflection 0.60 in.
Residual deflection 0.30 in.

b. Wet Tests
Load increments------400 lb
Maximum load--------4000 lb or 0.50 kips ft
At load of----------1200 lb average total deflection 0.28 in.
Residual deflection 0.44 in.
At load of----------2400 lb average total deflection 0.80 in.
Residual deflection 0.40 in.

4910.1

508 DOORS, WINDOWS AND GLAZING

A WINDOWS AND SLIDING GLASS DOORS - AIR INFILTRATION

A-1 Test Procedure. Air leakage shall be tested in accordance with ASTM E 283-91.

A-2 Performance Criteria

A. When tested at a static air pressure of 1.567 psf, the rate of air leakage shall not exceed 1/2 cfm per ft of crack length. Air leakage for jalousie windows is not to exceed 1 1/2 cfm per sq. ft. of total ventilating areas. Air leakage for sliding glass doors is not to exceed 1 cfm per sq. ft. of overall frame dimension.

b. In areas subject to winds (90 mph and over) the performance requirement for sliding glass doors may be increased at the discretion of the HUD Field Office so that the air leakage will not exceed 1/2 cfm per sq. ft. of overall frame dimension.

B WINDOWS AND SLIDING GLASS DOORS - WATER RESISTANCE

B-1 Test Procedure. Water infiltration shall be tested in accordance with ASTM E 331-86.

B-2 Performance Criteria

a. Minimum Performance - No water shall pass the interior face of the unit when tested at a static pressure of 2.86 psf with water applied at the rate of 5.0 U.S. gal. per sq. ft. per hour for a time period of 15 minutes.

b. In areas subject to wind driven rain (90 mph and over) the static pressure in (a) may be raised to 6.24 psf at the discretion of the HUD Field Office.

C WINDOWS AND SLIDING GLASS DOORS - PHYSICAL LOAD

C-1 Test Procedure Physical load tests shall be conducted in accordance with ASTM E 330-90.

C-2 Performance Criteria

a. Minimum Performance

(1) Under a uniform load of 10 psf applied to surface of unit, except jalousie windows and sliding glass doors, max. deflection of any member shall not exceed 1/175 of its span.

(2) Under a uniform load of 20 psf applied for 10 seconds to the ext., then a uniform load of 10 psf applied to the int. for 10 seconds, there shall be no glass breakage, damage to hardware or residual deflection.

b. In areas subject to winds 90 mph and over, the

uniform loads, shown in a. (2) may be increased to 40 psf exterior and 20 psf interior loadings, at the discretion of the HUD Field Office.

APPENDIX E

ACCEPTED ENGINEERING PRACTICE STANDARDS

Design and construction completed in accordance with the applicable standards, guides and recommendations contained in this Appendix shall be considered to satisfy the requirements of the MPS, unless stated otherwise. The list of approved incorporations by reference is Published in the * Code of Federal Regulations at 24 CFR Part 200 Appendix A.

100-1 DISABLED PERSONS

Uniform Federal Accessibility Standards (UFAS)
----------GSA, DOD, HUD, AND USPS 24 CFR Part 40

600 GENERAL

Intermediate Minimum Property Standards
Supplement - Solar Heating and Domestic
Hot Water Systems---------- HUD Handbook, 4930.2-1989

602 SITE

Thickness Design - Full Depth Asphalt Pavement
Structures for Highways and Streets - Asphalt
Institute---------- MS-1-1981
Installing Vitrified Clay
Sewer Pipe---------- ASTM C 12-91
Test for Moisture - Density
Relation of Soil---------- ASTM D 1557-91
Installing Bituminized Fiber
Drain & Sewer Pipe---------- ASTM D 2316-84
Floodplain Management---------- EO 11988
Protection of Wetlands---------- EO 11990

603 CONCRETE

Recommended Practice for Selecting Proportions for
Concrete---------- ACI 211.1-89
Recommended Practice for Selecting
Proportions for Structural Lightweight
Concrete---------- ACI 211.2-91
Guide for Structural Lightweight
Concrete---------- ACI 213R-87

CONCRETE - Continued

Recommended Practice for Evaluation of
Compression Test Results of

Field Concrete---------- ACI 214-83
Specifications for Structural Concrete for Buildings---------- ACI 301-89
Specifications for Concrete Aggregates------ ASTM C33-90
Design and Construction of Post-tensioned Slabs-on-Ground---------- PTI-1980
Criteria for Selection and Design of Residential Slabs-on-Ground, Report #33, Publications 1571---------- NAS-1968
Guide for Concrete Floor and Slab Construction----------ACI-302.1R-80
Guide to Joint Sealants for Concrete Structures---------- ACI 504R-77
Guide for Concrete Inspection---------- ACI 311.4R-88
Details and Detailing of Concrete Reinforcement---------- ACI 315-80
Building Code Requirements for Reinforced Concrete---------- ACI 318-92
Structural Plain Concrete---------- ACI 322-72
Recommended Practice for Concrete Formwork---------- ACI 347R-88
Recommended Practice for Shotcreting---------- ACI 506-66 (Rev. 1990)
A Guide to the Use of Waterproofing, Dampproofing, Protective and Decorative Barrier Systems for concrete---------- ACI 515.1R-85
Fabrication, Handling and Erection of Precast Concrete Wall Panels---------- ACI 533.3R-70
Quality Standards and Tests for Precast Concrete Wall Panels---------- ACI 533.1R-69
Selection and Use of Materials for Precast Concrete Wall Panels---------- ACI 533.2R-69
Hot Weather Concreting---------- ACI 305R-89
Cold Weather Concreting---------- ACI 306R-88
Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete---------- ACI 304R-73 (Rev. 89)

Manual for Quality Control for Plants and Production of Precast Prestressed Concrete Products---------- PCI MNL-116-85
Manual of Quality Control for Plants and Production

Architectural Precast
Concrete Products---------- PCI MNL-117-77
Code for Welding in Building
Construction---------- ANSI/AWS D1.1-90
Recommended Practices for
Welding Reinforcing
Steel, Metal Inserts and
Connection in Reinforced
Concrete Construction---------- AWS D1.4-79
Manual for Structural
Design of Architectural
Precast Concrete---------- PCI MNL-121-77

606 WOOD AND PLASTICS

Wood Decay in Houses - How to Prevent
and Control It---------- USDA Home and Garden
Bulletin No. 73-1986
Wood Frame House Handbook---------- USDA Agriculture
Handbook No. 73-1989
Subterranean Termites Their
Prevention and Control in
Buildings---------- USDA Home and Garden
Bulletin No. 64-1989
Wood Construction---------- National Design
Specification 1991
Edition including
amendments
Standard for Plastic
Toilets Seats
(Water Closet Seats)---------- ANSI Z 124.5-1989

607 THERMAL AND MOISTURE PROTECTION

Model Energy Code---------- CABO 1992 Edition
Insulation Manual, Homes-Apartments-------- NAHB-RF-1979
Handbook of Applications---------- ASHRAE-1987
Handbook of Equipment---------- ASHRAE-1988
Handbook of Systems---------- ASHRAE-1980
Handbook of Fundamentals---------- ASHRAE-1989
Cooling and Heating Load Calculations
Manual---------- ASHRAE GRP 158-1979
Window and Sliding Glass

THERMAL AND MOISTURE PROTECTION - Continued

Doors - Air Infiltration---------- Appendix D
Sections 508A and B
HUD MPS 4910.1

608 GLAZING

Glazing Sealing Systems

Manual---------- FGMA 1990
Glazing Manual---------- FGMA 1986

609 FINISH MATERIALS

Hardwood Flooring Installation
Manual---------- (NOFMA) - 1986
Hardwood Flooring Finishing/Refinishing
Manual---------- (NOFMA) - 1986
Recommended Installation
Specification for Solid Vinyl
and Asphalt Tile Flooring---------- RFCI - 1987
The Roofing and
Waterproofing Manual---------- NRCA - 1989
Residential Asphalt
Roofing Manual---------- ARMA - 1988
Specifications for Installation
of Residential Aluminum Siding--------- AAMA 1402-1989
Specifications for Aluminum Sheet
Metal Work in Building
Construction---------- AA-ASM-35-80
Application of Interior Gypsum
Plaster---------- ASTM C 842-90
Handbook for Ceramic Tile
Installation---------- TCA-1993
Installation of Steel Framing Members
to Receive Screw Attached Gypsum
Wallboard, Backing Board, or Water
Resistant Backboard---------- ASTM C 754-88
Installation of Interior
Lathing and Furring---------- ASTM C 841-90
Application of Gypsum Veneer
Plaster---------- ASTM C 843-92
Application of Gypsum Base to
Receive Gypsum
Veneer Plaster---------- ASTM C 844-85
Ceramic Tile Installation---------- ANSI A108.1A-92
Application of Portland
Cement Based Plaster---------- ASTM C 926-90
Specifiers Guide for Contract
Carpet Installation---------- CRI - 1984

---

611 EQUIPMENT

611-1 KITCHEN CABINETS

Recommended Minimum Construction
and Performance Standards for
Kitchen and Vanity
Cabinets---------- ANSI A 161.1-86

Certified Construction

Standards and
Specifications---------- SCACM-73

611-2 KITCHEN EQUIPMENT

National Fuel Gas Code--------- NFPA 54-92 (ANSI Z223.1)
Electrical Appliance and
Utilization Equipment
Directory---------- UL-1992

615 MECHANICAL

615-7 SPECIAL PIPING SYSTEMS
Standards---------- NFPA 54-92

Standard for the Storage
and Handling of Liquified
Petroleum Gases---------- ANSI Z 223.1/NFPA 58-1992

615-8 WATER SUPPLY

Drinking Water Standards

National Interim Primary
Drinking Water Regulations---------- EPA 40 CFR 141

Manual of Individual Water
Supply Systems---------- EPA 570/9-82-004

615-9 SEWAGE DISPOSAL SYSTEMS

HUD Handbook 4940.3-Rev.1-92
Installing Vitrified
Clay Pipe Sewers---------- ASTM C 12-91
Underground Installation
of Flexible Thermoplastic
Sewer Pipe---------- ASTM D 2321-89

APPENDIX F

USE OF MATERIALS BULLETINS

Appendix F is a partial list of Use of Materials Bulletins describing products and methods which are not included in the standard but which have been found to be technically suitable for use in HUD programs. For a complete listing of UM Bulletins, See HUD Handbook 4950.1

507 THERMAL AND MOISTURE PROTECTION

Polystyrene Foam Insulation Board	No. UM-71a-93
Spray Applied Cellulosic Thermal Insulation	No. UM-80-79

508 DOORS, WINDOWS, GLAZING PANELS

Aluminum Fenestration Products	No. UM-39b-93
Plywood, Grademarking	No. UM-40c-90
Wood Flush Doors	No. UM-52a-75
Acrylic Plastic Sheets for Glazing	No. UM-58a-75
Wood Fenestration Products	No. UM-59b-93
Polycarbonate Plastic Sheets for Glazing	No. UM-67-75
PVC Plastic Fenestration Products	No. UM-85a-93
Exterior Insulated Steel Door Systems	No. UM-89-93
Solar Water Heater Systems	No. UM-100-93

509 FINISH MATERIALS

Concrete Roofing Tile	No. UM-17e-74
Carpet	No. UM-44d-93
Textured Plywood Panel Siding	No. UM-64b-75
Factory-Applied Laminated Roofing Systems Based on Chlorosulfonated Polyethylene (CSPE)	No. UM-62a-72
Controlled Density Cellular Concrete Floor Fill	No. UM-65-73
Carpet Cushion	No. UM-72a-93

513 SPECIAL CONSTRUCTION MATERIALS

Power Driven, Mechanically Driven and Manually Driven Fasteners	No. UM-25d-73
Grademarking of Lumber	No. UM-38h-79

Labels of Independent Programs for Certifying Pressure-Treated Lumber and Plywood (PLUS 5 SUPPLEMENTS)----------No. UM-48-67

Particleboard Interior Stair Treads--------No. UM-70a-82

Plastic Bathtubs, Plastic Shower Stalls and Receptors, and Plastic Lavatories----------No. UM-73a-84

Chlorinated Poly (Vinyl Chloride) CPVC and Polybutylene (PB) Hot and Cold Water Distribution----------No. UM-76-78

Cast Iron Sanitary Drainage System With Hubless Pipe and Fittings----------No. UM-77a-80

Polyethylene (PE), Acrylonitrile-Butadiene-Styrene (ABS), Poly (Vinyl Chloride) (PVC) and Polybutylene (PB) Plastic Piping for Domestic Cold Water Service----------No. UM-78-78

Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste and Vent Pipe and Fittings----------No. UM-79a-82

Sealed Insulating Glass----------No. UM-82a-93

Solid Fuel Type Room Heaters and Fireplace Stoves----------No. UM-84-83

APPENDIX G (Links to appendix 49101xg.pdf)

SI Conversion Units

In view of the present accepted practice in this country for building technology, common U. S. units of measurement have been used throughout this publication. In recognition of the Metric Conversion Act of 1975, P. L. 94-168, appropriate conversion factors have been provided in the table below. The reader interested in making further use of the coherent systems of SI units is referred to: The Metric Guide for Federal Construction, First Edition as Published by the National Institute of Building Sciences.

Table of Conversion Factors to Metric (SI) Units

Physical Quality	To Convert From	To	Multiply By
Length	inch	meter	2.54* x 10{sup -2}
	foot	m	3.048* x 10 square
Area	inch square	m square	6.4516* x 10{sup -4}
	foot square	m square	.290 x 10 square
Volume	inch cubed	m cubed	1.639 x 10{sup -5}
	foot cubed	m cubed	2.832 x 10{sup -2}
Temperature	Fahrenheit	Celsius	t{sub c}=(F-32)/1.8
Temperature difference	Fahrenheit	Kelvin	K = (t{sub F})/1.8
Pressure	inch Hg (60F)	newton/m sq.	3.377 x 10 cubed
Mass	lbm	kg	4.536 x 10{sup -1}
Mass/unit area	lbm/sq. ft	kg/m sq.	4.882
Moisture content rate	lbm/sq. ft week	kg/ m sq.s	8.073 x 10{sup -6}
Density	lbm/ft cubed	kg/m cubed	1.602 x 10{sup 1}
Thermal conductivity	(Btu x in>)/ (hr x sq. Ft x F)	W/ mK	1.422 x 10{sup -1}
U-value	Btu/hr x ft x F	W/m sq.x K	5.678
Thermal resistance	(hr x ft x F)/Btu	m sq. x K/W	1/761 x 10

* Exact value; others are rounded to the minimum number of signature units.

APPENDIX H

MINIMUM PROPERTY STANDARDS REFERENCE SOURCES

This Appendix gives the addresses from which the standards referenced in the Minimum Property Standards can be obtained.

Abbreviation	Address
AA	Aluminum Association, Inc. 900 19th Street, NW, Suite 300 Washington, DC 20006
AAMA	American Architectural Manufacturers Association 1540 East Dundee Road, Suite 310 Paletine, IL 60067
ACI	American Concrete Institute 22400 W. Seven Mile Road Detroit, Michigan 48219
AFPA	American Forest & Paper Association 1111 19th Street, NW; Suite 800 Washington, DC 20036
AHA	American Hardboard Association 1210 W. Northwest Highway Palatine, IL 60067
AIA	American Institute of Architects 1735 New York Ave., NW Washington, DC 20006
ANSI	American National Standards Institute 11 West 42nd Street New York, NY 10036
ARMA	Asphalt Roofing Manufacturers Association 6288 Montrose Road Rockville, MD 20852
ASCE	American Society of Civil Engineers 345 E 47th Street New York, NY 10017
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, NE, Atlanta, GA 30329

ASME	American Society of Mechanical Engineers 345 E 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWS	American Welding Society 550 NW Le Jeune Road Miami, FL 33126
BOCA	Building Officials and Code Administrators International 4051 West Flossmoor Road Country Club Hills, IL 60477
CABO	Council of American Building Officials 5203 Leesburg Pike Suite 708 Falls Church, VA 22041
CPSC	Consumer Product Safety Commission Washington, DC 20207
CRI	Carpet and Rug Institute 310 Holiday Avenue, Box 2048 Dalton, GA 30720
CS	Commercial Standard, See NIST
DOT	Department of Transportation Office of Pipeline Safety 400 7th Street, SW Washington, DC 20590
EO	National Archives and Records Administration Office of the Federal Register Presidential Documents and Legislative Division Washington, DC 20408
EPA	Environmental Protection Agency 401 M Street, SW Washington, DC 20460
FGMA	Flat Glass Marketing Association White Lakes Professional Building 3310 Harrison Street Topeka, KS 66611

FHDA	Fir and Hemlock Door Association Yeon Building

Portland, OR 97204

FS — Department of Defense
Naval Publication and Forms Center
5801 Taber Road
Philadelphia, PA 19120

HPVA — Hardwood Plywood and Veneer Association
1825 Michael Faraday Drive
Reston, VA 22090

HUD — Department of Housing and Urban Development
451 Seventh Street, SW
Attention: Mail Room B-133
Washington, DC 20410

ISWA — Insect Screening Weavers Association
2000 Maple Hill Street
P. O. Box 309
Yorktown Heights, NY 10598

KCMA — Kitchen Cabinet Manufacturers Association
1819 Preston White Drive
Reston, VA 22091

MS — Asphalt Institute
Asphalt Institute Building
College Park, MD 20740

NAHB-RF — National Association of Home Builders
- Research Center
400 Prince Georges Boulevard
Upper Marlboro, MD 20772

NAIMA — North American Insulation Manufacturers Association
1420 King Street
Alexandria, VA 22314

NAS — National Academy of Sciences
2101 Constitution Avenue, NW
Washington, DC 20418

NCDC — National Climatic and Data Center
Federal Building
Asheville, NC 28801-2696

NFPA — National Fire Protection Association
Batterymarch Park
Quincy, MA 02269

NIBS — National Institute of Building Sciences
1201 L Street, NW

Washington, DC 20005

NIST Department of Commerce
National Institute of Standards and Technology
Gaithersburg, MD 20899

NOFMA National Oak Flooring Manufacturers Association
22 North Front Street
Memphis, TN 38103

NRCA National Roofing Contractors Association
10255 W. Higgins Road
Suite 600
Rosemont, IL 60018

NSDJA National Sash and Door Jobbers Association
20 North Wacker Drive
Chicago, IL 60606

NSPI National Spa and Pool Institute
2111 Eisenhower Avenue
Alexandria, VA 22314

NTMA National Terrazzo and Mosaic Association
3166 Des Plaines Avenue
Suite 132
Des Plaines, IL 60018

NWWDA National Wood Window and Door Association
1400 East Touhy Avenue
Suite G54
Des Plaines, IL 60018

PCI Prestressed Concrete Institute
175 West Jackson Boulevard
Chicago, IL 60604

PHCC National Association of Plumbing-Heating-Cooling Contractors
P. O. Box 6808
Falls Church, VA 22046

PS Product Standards, NIST

PTI Post-tensioning Institute
301 West Osborn
Suite 3500
Phoenix, AZ 85013

RFCI Resilient Floor Covering Institute
966 Hungerford Drive, Suite 12-B
Rockville, MD 20850

SCACM	Southern California Association of Cabinet Manufacturers 1933 South Broadway, L. 39 Los Angeles, CA 90007
SGCC	Safety Glazing Certification Council c/o ETL Testing Laboratories Industrial Park, Route 11 Cortland, New York 13045
SDI	Steel Door Institute 30200 Detroit Road Cleveland, OH 44145
TAI	The Asphalt Institute Asphalt Institute Building College Park, MD 20740
TCA	Tile Council of America, Inc. Box 326 Princeton, NJ 08542
UL	Underwriters Laboratories 333 Pfingsten Road Northbrook, IL 60062
UM	Use of Materials Bulletin
USDA	Department of Agriculture Publications Division 14th and Independence Avenue, SW Washington, DC 20050
WM	Wood Moulding and Millwork Producers P. O. Box 25278 Portland, OR 97225
WQA	Water Quality Association 4151 Naperville Road Lisle, IL 60532

APPENDIX I

24 C.F.R 200.925a-c
Rules for Multifamily and Care-Type Housing

The following portions of 24 C.F.R Part 200 have been included for the convenience of the users of this handbook. These Provisions established procedures relating to the use of local or model codes in conjunction with the standards contained in this handbook.

200.925a Multifamily and care-type minimum property standards.

(a) Construction Standards. Multifamily or care-type properties shall comply with the minimum property standards contained in the handbook identified in 200.929(b)(2). In addition, each such property shall, for the Department's purposes, comply with:

(1) The applicable state or local building code, if the property is located within a jurisdiction which has a building code accepted by the Secretary under 200.925(d); or

(2) (i) The applicable State or local building code, and

(ii) Those portions of the codes identified in 200.925c which are designated by the HUD Field Office serving the jurisdiction in which the property is to be located, if the property is located in a jurisdiction which has a building code partially; accepted by the Secretary; or

(3) The appropriate codes, as identified in 200.925c(c), if the property is not located within a jurisdiction which has a building code accepted by the Secretary.

(b) Conflicting Standards. The minimum property standards contained in the handbook identified in 200.929(b)(2) do not preempt State or local standards, nor do they alter or affect a builder's obligation to comply with any State or local requirements. However, a property shall be eligible for benefits only if it complies with all applicable minimum property standards, including referenced standards.

(c) Standard for Evaluating Local Building Codes. The

Secretary shall compare a State or local building code applicable to residential or institutional occupancy, as appropriate and submitted under 200.925a(d), to the list of construction related areas contained in 200.925b.

(1) A State or local code will be accepted if it regulates each area on the list. However, for seismic design, ASCE 7-88 is mandatory.

(2) A State or local building code will be partially accepted if it regulates most of the areas on the list provided, however, that no code may be partially accepted if it fails to regulate subareas in more than one of the major areas: fire safety, light and ventilation, structural loads, seismic design, foundation systems, materials standards, construction components, glass, mechanical, plumbing, electrical and elevators, See 200.925b.

(3) For purposes of this paragraph, a State or Local code regulates an area if it establishes a standard concerning that area. However, for seismic design ASCE 7-88 is mandatory.

(d) Review Process and Acceptance.

(1) Jurisdictions without previously accepted building codes. The following submission requirements apply to developers and other interested parties in jurisdictions without building codes, jurisdictions with building codes which have never been submitted for acceptance, and jurisdictions with building codes which have been submitted for acceptance and neither accepted nor partially accepted by the Secretary.

(i) Developers or other interested parties must comply with one of the following by the time of application for insurance or other benefits:

(A) The developer or other interested party may choose to comply with the appropriate codes as identified in 200.925c. If the developer or other interested party so chooses, then the multifamily or care-type property shall be constructed in accordance with one of the model codes designated in subparagraph (c) (1), (2) or (3) of 200.925c and with any other code or codes identified in the same paragraph. In such instances, the

developer or other interested party shall notify the Department of the code or group of codes with which it intends to comply by the time of application for insurance or other benefits; or

(B) The developer or other interested party may choose to comply with the State or local building code, if such code is acceptable to the Secretary. To obtain the Secretary's acceptance, the developer or other interested party shall submit the material specified in 200.925a(d)(1)(ii) to the HUD Field Office serving the jurisdiction in which the property is to be constructed. Such material may be submitted at any time provided, however, that it must be submitted no later than the time of application for mortgage insurance or other benefits.

(ii) If, under 200.925a(d)(1)(i)(B), the developer or other interested party chooses to comply with the State or local building codes as prescribed in 200.925a(a)(1), it shall submit the following material to the HUD Field Office serving the jurisdiction in which the property is to be constructed:

(A) A copy of the jurisdiction's building code, including all applicable service codes, appendices and referenced standards;

(B) A copy of the statute, ordinance, regulation, or order establishing the code, if such statute, ordinance, regulation or order is not contained in the building code itself.

However, the developer or other interested party need not submit any part already on file in the Field Office; and,

(2) Jurisdictions with previously accented or partially accepted building codes. The following submission requirements apply to developers and other interested parties in any jurisdiction with a building code which has been accepted or partially accepted by the Secretary:

(i) At the time of application for mortgage insurance or other benefits, the developer or other interested party shall submit to the HUD Field Office servicing the jurisdiction in which the property is to be constructed;

(A) A certificate stating that, since its acceptance by the Secretary, the jurisdiction's building code has not been changed; or

(B) (1) A copy of all changes to the jurisdiction's building code, including all applicable service codes and appendices, which have been made since the date of the code's acceptance by the Secretary. However, the developer or other interested party need not submit any part already in the possession of the Field Office; and

(2) A copy of the statute, ordinance, regulation, or order making such changes in the code.

(3) Notification of Decision. The Secretary shall review the material submitted under 200.925a(d)(1)(ii) and 200.925a(d)(2)(i). Following that review, the Secretary shall issue a written notice (except in the case of a previously accepted code which hasn't been changed) to the submitting party stating whether a State or local building code has been accepted, partially accepted, or whether the Secretary's previous acceptance or partial acceptance has been continued; the basis for the Secretary's decision; and a notification of the submitting party's right to present its views concerning the denial of acceptance if the code is neither accepted nor partially accepted. The Secretary may, in his discretion, permit either an oral or written presentation of views.

(i) If a developer or other interested party is notified that a State or local building code has not been accepted, then the multifamily or care-type properties eligible for HUD benefits in that jurisdiction shall be constructed in accordance with appropriate codes indicated in 200.925c(c). In such instances, the developer or other interested party shall notify the HUD Field Office of the code or

codes with which it chooses to comply, in accordance with 200.925a(d)(1)(i)(A).

(ii) If a developer or other interested party is notified that a State or local building code has been partially accepted, the multifamily or care-type properties eligible for HUD benefits in that jurisdiction shall be constructed in accordance with the applicable State or local building code, plus those additional requirements identified in the written notice issued by the Secretary under 200.925a(d)(3). The written notice shall identify, in accordance with Appendix J of the Handbook identified in 200.929 (b)(2), those portions of the codes listed at 200.925c(a) with which the property must comply.

(iii) Each Field Office will maintain a current list of jurisdictions with accepted building codes in a current list of jurisdictions with partially accepted building codes. The lists shall indicate acceptance or partial acceptance, and will be available to any interested party upon request. In addition, the list of jurisdictions whose codes have been partially accepted shall identify those portions of the codes listed at 200.925c(a) with which the property must comply.

200.925b Residential and institutional building code comparison items.

HUD will review each local code submitted under this Chapter to determine whether it regulates all of the following areas and subareas:

(a) Fire safety.

(1) Construction types permitted;
(2) Allowable height and area;
(3) Fire separations;
(4) Fire resistance requirements;
(5) Means of egress (number and distance);
(6) Individual unit smoke detectors;
(7) Building alarm systems;
(8) Highrise criteria.

(b) Light and ventilation.

(1) Habitable rooms;
(2) Bath and toilet rooms.

(c) Structural loads.

(1) Design live loads;
(2) Design dead loads;
(3) Snow loads;
(4) Wind loads; use ASCE 7-88
(5) Earthquake loads (in localities identified by ASCE 7-88 (Formerly ANSI A58.1) as being is seismic zones 1, 2, 3, or 4, and Guam.);
(6) Special loads, i.e., soil pressure, railings, interior walls etc.

(d) Foundation systems.

(1) Soil test;
(2) Foundation depths;
(3) Footings;
(4) Foundation materials criteria;
(5) Piles, i.e., materials, allowable stresses, design;
(6) Excavation.

(e) Materials standards.

(f) Construction components.

(1) Steel;
(2) Masonry;
(3) Concrete;
(4) Gypsum;
(5) Lumber;
(6) Roof construction and covering;
(7) Chimneys and fireplaces.

(g) Glass.

(1) Thickness/area requirements;
(2) Safety glazing.

(h) Mechanical.

(1) Heating, cooling and ventilation systems;
(2) Boilers and pressure vessels;
(3) Gas, liquid and solid fuel piping and equipment;
(4) Chimneys and vents;
(5) Ventilation (air changes).

(i) Plumbing.

(1) Materials standards;
(2) Sizing and installing drainage systems;
(3) Vents and venting;

(4) Traps;
(5) Cleanouts;
(6) Plumbing fixtures;
(7) Water supply and distribution;
(8) Storm drain systems.

(j) Electrical.

(1) Wiring design and protection;
(2) Wiring methods and materials;
(3) Equipment for general use;
(4) Special equipment;
(5) Special conditions;
(6) Communication systems.

(k) Elevators

(1) Reference ASME/ANSI Standard A17.1-1987; and the ASME/ANSI A17.1-1989 Addenda.
(2) Acceptance tests and periodic tests.

200.925c Model Codes.

(a) Incorporation by reference. The following publications are incorporated by reference under 5 U.S.C. 522(a) and 1 CFR Part 51. The incorporation by reference of these publications has been approved by the Director of the Federal register. The locations where copies of these publications are available are set forth below.

(1) Model Building Codes.

(i) The BOCA National Building Code, Plumbing Code and Mechanical Code, 1993 Editions, Chapter 1, administration and enforcement are to be excluded from each code as well as the words "or fire retardant wood for a distance of 4 feet (1219 mm) from the wall" in exception number 1 of paragraph 705.6 of the Building Code. The Appendices or reference standards are to be included as a part of the codes. Available from the Building Officials and Code Administrators International, Inc., 4051 West Flossmoor Road, Country Club Hills, IL 60478.

(ii) The Southern Standard Building, Plumbing, Mechanical and Gas Code, 1991 Editions

including the 1992 and 1993 to the building code and the 1992 revisions to the Gas and Mechanical Codes, but excluding Chapter 1 - Administration from each code and the phrase "or fire retardant treated wood" in reference note (a) of table 600 Chapter 6 of the Building Code but including Appendices A, C, E, J, K, M and R. Available from the Southern Building Code Congress International, Inc., 900 Montclair Road, Birmingham, AL 35213.

(iii) Uniform Building Code, 1991 Edition including the 1993 Accumulative Supplement, but excluding Part I - Administrative, and the reference to fire retardant treated plywood in Section 2504(c)3 and to fire retardant treated wood in 1 - HR type III and V construction referenced in paragraph 4203.2., but including the Appendix of the Code. Uniform Plumbing Code, 1991 Edition, including the 1992 Code Changes but excluding Part I - Administration, but including the Appendices of the Code. Uniform Mechanical Code, 1991 Edition, including the 1993 Accumulative Supplement but excluding Part I - Administrative, but including the Appendices of the Code. All available from the International Conference of Building Officials, 5360 South Workman Mill Road, Whittier, CA 90601.

(2) National Electrical Code, NFPA 70, 1993 Edition, including the appendices. Available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

(3) National Standard Plumbing Code, 1993 Edition, including appendices. Available from the National Association of Plumbing - Heating - Cooling Contractors, P. O. Box 6808, Falls Church, VA 22046.

(b) Model Code Compliance Requirements.

(1) When a multifamily or care-type property is to comply with the model building codes set forth in 200.925c(a)(1), the following requirements of those model codes shall not apply to those properties:

(i) Those provisions of the model codes that do not pertain to residential or institutional buildings;

(ii) Those provisions of the model codes that establish energy requirements for multifamily or care-type structures and;

(iii) Those provisions of the model codes that require or allow the issuance of permits of any sort.

(2) Where the model codes set forth in 200.925c(a)(1) designate a building, fire, mechanical, plumbing or other official, the Secretary's designee in the HUD Field Office serving the jurisdiction in which the property is to be constructed shall act as such official.

(c) Designation of Model Codes. When a multifamily or care-type property is to comply with a model code, it shall comply with one of the model codes designated in paragraph (1), (2), (3) or (4) below and with any other code or codes identified in the same paragraph. In addition, such property shall comply with all of the standards which are incorporated into such code or codes by reference. The developer or other interested party shall notify the Department of the code or group of codes with which it intends to comply by the time of application for insurance or other benefits.

(1) The BOCA National Building, Plumbing and Mechanical Code, 1993 Edition.

(2) Standard Building, Plumbing, Mechanical and Gas Codes, 1991 Editions, including the 1992 and 1993 supplements.

(3) Uniform Building, Plumbing and Mechanical Codes, 1991 Editions, including the 1993 supplement.

(4) The National Electrical Code. NFPA 70, 1993 Edition.

APPENDIX J

Model Code Provisions for Use in Partially Accepted Code Jurisdictions

If a developer or other interested party is notified that a State or local building code has been partially accepted, then the multifamily and care-type properties eligible for HUD benefits in that justification shall be constructed in accordance with the applicable State or local building code, plus those additional requirements identified in the written notice issued by the Secretary under 24 CFR 200.925a(d)(3).

Depending upon the major area which is not fully regulated by the local code, the HUD Field Office will designate, in accordance with the schedule below, those portions of one of the model codes with which the property must comply. The HUD Field Office is responsible for selecting the particular model code from which the portions are taken.

4910.1

Pages 1 and 2 in PDF Format (Link to 49101xj.pdf)

APPENDIX K

24 CFR 200.926
Minimum Property Standards for Property which is not Multifamily or Care-type Property

The following portions of 24 C.F.R. Part 200 have been included for the convenience of the users of this handbook. These provisions establish procedures for the construction of one and two family dwellings and reference standards found in the Appendices of this handbook.

200.926 Minimum property standards for one- and two-family dwellings.

(a) Construction standards.

(1) Applicable structures. The standards identified or contained in this section and 200.926 and 200.926a-200.926e shall apply to single family detached homes, duplexes, triplexes and to living units in a structure where the units are located side-by-side in townhouse fashion.

(2) Applicability of standards to new construction. The standards referenced in paragraph (a)(1) of this section are applicable to:

(i) Structures approved for insurance or other benefits prior to the start of construction, including approval under the direct endorsement process described in 203.5 of this chapter;

(ii) Structures which are approved for insurance or other benefits based upon participation in an insured warranty program;

(iii) Structures which are insured as new construction based upon a Certificate of Reasonable Value issued by the Veterans Administration.

(b) Conflicting standards. The requirements contained in 200.926d do not preempt local or State standards, nor do they alter or affect a builder's obligation to comply with any local or State requirements. However, a property shall be eligible for benefits only if it complies with the requirements of this subpart, including any referenced standards. When any of the requirements identified in 200.926c are in conflict with a partially accepted local or State code, the conflict will be resolved by the HUD Field

Office servicing the jurisdiction in which the property is to be located.

(c) Standard for evaluating local or State building codes. The Secretary shall compare a local building code submitted under 200.926(d) or a State code to the list of construction related areas contained in 200.926a.

(1) A local or State code will be accepted if it regulates each area and subarea on the list. However, for seismic design, ASCE 7-88, is mandatory.

(2) A local or State building code will be partially accepted if it regulates most of the areas on the list provided, however, that no code may be partially accepted if it fails to regulate subareas in more than one of the major areas. The major areas are: fire safety, light and ventilation, structural loads, foundation systems, materials, standards, construction components, glass, mechanical, plumbing and electrical. See 200.926a.

(3) For purposes of this paragraph, a local or State code regulates an area or subarea if it establishes a standard concerning that area or subarea.

(d) Code selection. Any materials required to be submitted under this section must be submitted by the time the lender or other interested party applies for mortgage insurance or other benefits.

(1) Jurisdictions without previously accepted building codes. The following submission requirements apply to lenders and other interested parties in jurisdictions without building codes, jurisdictions with building codes which previously have never been submitted for acceptance and jurisdictions with building codes which previously have been submitted for acceptance and have not been accepted or partially accepted by the Secretary.

(i) In jurisdictions without local building codes:

(A) If the State building code is acceptable, the lender or other interested party must comply with the State building code and the requirements of 200.926d;

(B) If the State building code is partially acceptable, the lender or other interested party must comply with:

(1) The acceptable portions of the partially acceptable code;

(2) Those portions of the CABO One- and Two-Family Dwelling Code or the Electrical Code for One- and Two-Family Dwellings, designated by the HUD Field Office, in accordance with 200.926c; and

(3) The requirements of 200.926d.

(C) If there is no State building code or if the State building code is unacceptable, the lender or other interested party may comply with:

(1) The CABO One- and Two-Family Code and the Electrical Code for One-and Two-Family Dwellings, as identified in 200.926b(a); and

(2) The requirements of 200.926d.

(ii) In jurisdictions with local building codes which have never been submitted for review, lenders or other interested parties must:

(A) Comply with the requirements of 200.926(d)(1)(i)(A), (B) or (C), as appropriate; or

(B) Request the Secretary's acceptance of the local building code in accordance with 200.926(d)(1)(iv).

(1) If the Secretary determines that the local building code is unacceptable, then the lender or other interested party must comply with the requirements of 200.926 (d)(1)(i)(A), (B) or (C), as appropriate.

(2) If the Secretary determines that the local code is partially acceptable, then the lender or other interested party must comply with:

(i) The acceptable portions of the partially acceptable local code;

(ii) Those portions of the CABO One- and Two-Family Dwelling Code or Electrical Code for One- and Two-Family Dwellings designated by the HUD Field Office in accordance with 200.926c;

(iii) The requirements of 200.926d; and

(3) If the Secretary determines that the local code is acceptable, then the lender or other interested party must comply with the local building code and the requirements of 200.926d.

(iii) In jurisdictions with local building codes which previously have been submitted for review and which have been found unacceptable by the Secretary:

(A) If the local code has not been changed since the date the code or changes thereto were submitted to the Secretary, the lender or other interested party must comply with the requirements of 200.926(d)(1)(i)(A), (B) or (C), as appropriate; or

(B) If the local code has been changed since the date when the code or changes thereto were submitted to the Secretary, the lender or other interested party must submit a copy of all changes to the local building code, including all applicable service codes and

appendices and a copy of the statute, ordinance, regulation or order making such changes in the code, which have been made since the date when the code or other changes thereto were last submitted to the Secretary. However, the lender or other interested party need not submit any part already in the possession of the HUD Field Office. Based upon the Secretary's determination concerning the acceptability of the local code as changed, the lender or other interested party must comply with the requirements of 200.926(d)(1)(ii)(B)(1), (2) or (3), as appropriate.

(iv) In order to obtain the Department's approval of a local code, the lender or other interested party must submit the following material to the HUD Field Office serving the jurisdiction in which the property is to be constructed:

(A) A copy of the jurisdiction's local building code, including all applicable service codes and appendices; and

(B) A copy of the statute, ordinance, regulation, or order establishing the code, if such statute, ordinance, regulation or order is not contained in the building code itself. However, the lender or other interested party need not submit any document already on file in the HUD Field Office.

(2) Jurisdictions with previously accepted or partially accepted building codes.

(i) The lender or other interested party shall submit to the HUD Field Office serving the jurisdiction in which the property is to be constructed:

(A) A certificate stating that since the date when the code or any changes thereto were last submitted to the Secretary, the jurisdiction's local building code has not been changed; or

(B) (1) A copy of all changes to the jurisdiction's building code, including all applicable service codes, and appendices, which have been made since the date when the code or other changes thereto were last submitted to the Secretary. However, the lender or other interested party need not submit any part already in the possession of the HUD Field Office; and

(2) A copy of the statute, ordinance regulation, or order making such changes in the code.

(ii) If, based upon changes to the local building code, the Secretary determines that it is unacceptable, the lender or other interested party must comply with the requirements of 200.926(d)(1)(i)(A), (B) or (C), as appropriate.

(iii) If the local building code was previously found by the Secretary to be partially acceptable and there have been no changes to it or if the local building code was previously found by the Secretary to be partially acceptable and if, based upon changes to it, the Secretary determines that it is still partially acceptable or if the local building code was previously found by the Secretary to be acceptable and if, based upon changes to it the Secretary determines that it is partially acceptable, then the lender or other interested

party must comply with 200.926(d)(1)(ii)(B), (2)(i), (ii) and (iii).

(iv) If the local building code was previously found by the Secretary to be partially acceptable and if, based upon changes to it, the Secretary determines that it is acceptable, or if the local building code was previously found by the Secretary to be acceptable and there have been no changes to the code, or if the local building code was previously found by the Secretary to be acceptable and if, based upon changes to it, the Secretary determines that it is still acceptable, then the lender or other interested party must comply with the local building code and the requirements of 200.926d.

(3) Notification of decision. The Secretary shall review the material submitted under 200.926(d). Following that review, the Secretary shall issue a written notice (except where there is a previously accepted or partially accepted code which has not been changed) to the submitting party stating whether local building code is acceptable, partially acceptable or not acceptable. Where the local building code is not acceptable, the notice shall also state whether the State code is acceptable, partially acceptable or not acceptable. The notice shall also contain the basis for the Secretary's decision and a notification of the submitting party's right to present its views concerning the denial of acceptance if the code is neither accepted nor partially accepted. The Secretary may, in his discretion, permit either an oral or written presentation of views.

(i) Fire retardant treated plywood, where approved by a State or local building code, shall not be permitted for use in roof construction unless a HUD technical suitability bulletin has been issued by the Department for that product.

(ii) The Secretary shall review the material submitted under 200.926(d). Following that review, the Secretary shall issue a written notice (except where there is a previously accepted or partially accepted code which has not been changed) to the submitting party stating whether the local building code is acceptable, partially acceptable or not acceptable. Where the local building code is not acceptable, the notice shall also state whether the State code is acceptable, partially acceptable or not acceptable. The notice shall also state the basis for the Secretary's decision and a

notification of the submitting party's right to present its views concerning the denial of acceptance if the code is neither accepted nor partially accepted. The Secretary may, in his or her discretion, permit either an oral or written presentation of views.

(4) Department's responsibilities.

(i) Each Field Office will maintain a current list of jurisdictions with accepted local or State building codes, a current list of jurisdictions with partially accepted local or State building codes which have not been accepted. For local codes, the lists will state the most recent date when the code or changes thereto were submitted to the Secretary. The lists, which shall be prepared by the Field Offices, will be available to any interested party upon request. In addition, the list of jurisdictions whose codes have been partially accepted shall be identified in accordance with 200.926c those portions of the codes listed at 200.926b(a) with which the property must comply.

(ii) The Department is responsible for obtaining copies of the State codes and any changes thereto.

200.926a Residential building code comparison items.

HUD will review each local and State code submitted under this subpart to determine whether it regulates all of the following areas and subareas:

(a) Fire safety.

(1) Allowable height;
(2) Fire separations;
(3) Fire resistance requirements;
(4) Egress doors and windows;
(5) Unit smoke detectors;
(6) Flame spread.

(b) Light and ventilation.

(1) Habitable rooms;
(2) Bath and toilet rooms.

(c) Structural loads.

(1) Design live loads;
(2) Design dead loads;
(3) Snow loads (for jurisdiction with snow loading conditions identified in Section 7 of ASCE-7-88 (Formerly ANSI A58.1)
(4) Wind loads; Use ASCE-7-88
(5) Earthquake loads (for jurisdictions in seismic zones 3 or 4 as identified in Section 9 of ASCE-7-88 (Formerly ANSI A58.1)

(d) Foundation systems.

(1) Foundation depths;
(2) Footings;
(3) Foundation materials criteria.

(e) Materials standards.

(1) Materials standards.

(f) Construction components.

(1) Steel;
(2) Masonry;
(3) Concrete;
(4) Lumber;
(5) Roof construction and covering;
(6) Chimneys and fireplaces.

(g) Glass.

(1) Thickness/area requirements;
(2) Safety glazing.

(h) Mechanical.

(1) Heating, cooling and ventilation systems;
(2) Gas, liquid and solid fuel piping and equipment;
(3) Chimneys and vents;
(4) Ventilation (air changes).

(i) Plumbing.

(1) Materials standards;
(2) Sizing and installing drainage systems;
(3) Vents and venting;
(4) Traps;
(5) Cleanouts;
(6) Plumbing fixtures;
(7) Water supply and distribution;

(8) Sewage disposal systems.

(j) Electrical.

(1) Branch circuits;
(2) Services;
(3) Grounding;
(4) Wiring methods;
(5) Cable;
(6) Conduit;
(7) Outlets, switches and junction boxes;
(8) Panelboards.

200.926b Model codes.

(a) Incorporation by reference. The following model code publications are incorporated by reference in accordance with 5 U.S.C. 522(a) and 1 CFR Part 51. The incorporation by reference of these publications has been approved by the Director of the Federal Register. The locations where copies of these publications are available are set forth below.

(1) CABO One and Two Family Dwelling Code, 1992 Edition including the 1993 amendments but excluding Chapter I - Administration, and the phrase "or fire retardant wood" contained in the exception of paragraph R-218.2.2(2) but including the Appendices A, B, D, and E of the code. (Available from the Council of American Building Officials, Suite 708, 5203 Leesburg Pike, Falls Church, VA 22041.)

(2) Electrical Code for One and Two Family Dwellings, NFPA 70A, 1990 Edition, including appendices. Available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

(b) Model code compliance requirements.

(1) When a one or two family dwelling is to comply with the model codes set forth in 200.926(a), the following requirements of those model codes shall not apply to those properties:

(i) Those provisions of the model codes that require or allow the issuance of permits of any sort.

(2) Where the model codes set forth in 200.926b(a) designate a building, fire, mechanical, plumbing or other official, the Secretary's designee in the HUD Field Office serving the jurisdiction in which the dwelling is to be constructed shall act as such officials.

(c) Designation of Model Codes. When a one or two family dwelling or townhouse is to comply with portions of the model code or the entire code, the dwelling shall comply with the CABO One and Two Family Dwellings Code 1992 Edition, including the 1993 amendments but excluding Chapter I - Administration, or portions thereof as modified by 200.926d(e) of this part and designated by the HUD Field Office serving a jurisdiction in which the property is located. In addition, the property shall comply with all the standards which are referenced for any designated portions of the model code, and with the Electrical Code for One and Two Family Dwellings, NFPA 70A, 1990.

(1) CABO One and Two Family Dwelling Code, 1992 Edition with the 1993 amendments.

(2) Electrical Code for One and Two Family Dwellings, NFPA 70A, 1990.

200.926C Model code provisions for use in partially accepted code jurisdictions.

If a lender or other interested party is notified that a State or local building code has been partially accepted, then the properties eligible for HUD benefits in that jurisdiction shall be constructed in accordance with the applicable State or local building code, plus those additional requirements identified below. Depending upon the major area identified in 200.926a which is not adequately regulated by the State or local code, the HUD Field Office will designate, in accordance with the schedule below, those portions of one of the model codes with which the property must comply.

Schedule for Model Code Supplements to Local or State Codes

Deficient major from 200.926a as determined by Field Office review	Portions of the CABO One and Two Family Dwelling Code, 1992 Edition including the 1993 amendments with which a property must comply and Electrical code for One and Two Family Dwellings (NFPA 70A-1990)
(a) Fire safety	Chapters 2, 9,; Section R-402.
(b) Light and ventilation	Chapter 2; Section R-309.
(c) Structural loads	Chapter 2.
(d) Foundation systems	Chapter 3.

(e) Materials standards..... Chapter 26.
(f) Construction components..... Part III.
(g) Glass..... Chapter 2.
(h) Mechanical..... Part IV.
(i) Plumbing..... Part V.
(j) Electrical..... Electrical Code for One and Two Family Dwellings (NFPA 70A-1990)

200.926d Construction Requirements

(a) Application.

(1) General.

These standards cover the agency requirements for accessibility to physically disabled people, variations to standards, real estate entity, trespass and utilities, site conditions, access, site design, streets, dedication of utilities, drainage and flood hazard exposure, special construction and product acceptance, thermal requirements, and water supply systems.

---

(2) Requirements for Accessibility to Physically Disabled People

The HUD Field Office will advise project sponsors as to the extent accessibility will be required for new construction of one- and two-family dwellings on a project-by-project basis.

(i) Technical Standards

See HUD, Minimum Property Standards, 4910.1 See 24 CFR Part 40.

(3) Variations to standards.

(i) New materials and technologies.

See 200.926d(d). Alternatives, nonconventional or innovative methods and materials shall be equivalent to these standards in the areas of structural soundness, durability, economy of maintenance or operation and usability.

(ii) Variation procedures.

Variations from the requirements of any standard with which the Department requires compliance shall be made in the following ways:

(A) For a particular design or construction method to be used on a single case or project, the decision is the responsibility of the Field Office. Headquarters concurrence is not required.

(B) Where a variation is intended to be on a repetitive basis, a recommendation for a Local Acceptable Standard, substantiating data, and background information shall be submitted by the Field Office to the Director, Office of Manufactured Housing and Regulatory Functions.

(iii) Variances which require individual analysis and decision in each instance are not considered as repetitive variances even though one particular standard is repeatedly the subject of variation. Such variances are covered by 200.926d(a)(3)(ii)(A).

(b) General acceptability criteria.

(1) Real estate entity.

The property shall comprise a single plot except that a primary plot with a secondary plot for an appurtenant garage or for other use contributing to the marketability of the property will be acceptable provided the two plots are in such proximity as to comprise a readily marketable real estate entity.

(2) Service and facilities.

(i) Trespass.

Each living unit shall be one that can be used and maintained individually without trespass upon adjoining properties, except when the windowless wall of a detached dwelling is located on a side lot line. A detached dwelling may be located on a side lot line if:

(A) Legal provision is made for permanent access for the maintenance of the exterior portion of the lot line wall, and

(B) The minimum distances from the dwelling to the dwellings on the abutting properties are not less than the sum of

the side yard distances computed as appropriate for the type of opposing walls. (Minimum distance 10 ft.)

(ii) Utilities.

Utility services shall be independent for each living unit, except that common services such as water, sewer, gas and electricity may be provided for living units under a single mortgage or ownership. Separate utility service shut-off for each unit shall be provided. For living units under separate ownership, common utility services may be provided from the main to the building line when protected by an easement or convenant and maintenance agreement acceptable to HUD, but

shall not pass over, under or through any other living unit. Individual utilities serving a living unit may not pass over, under or through another living unit under the same mortgage unless provision is made for repair and maintenance of utilities without trespass or when protected by an easement of covenant providing permanent access for maintenance and repair of the utilities. Building drain cleanouts shall be accessible from the exterior where a single drain line within the building serves more than one unit.

(3) Site conditions.

(i) The property shall be free of those foreseeable hazards and adverse conditions which may affect the health and safety of the occupants or the structural soundness of the improvements, or which may impair the customary use and enjoyment of the property. The hazards include toxic chemicals, radioactive materials, other pollution, hazardous activities, potential damage from soil or other differential ground movements, ground water, inadequate surface drainage, flood, erosion, or other hazards located on or off site. The site must meet the standards set forth at 24 CFR Part 51, and HUD Handbook 4910.1, Section 606 for termite and decay protection.

(ii) When special conditions exist or arise during construction which were unforeseen and which

necessitate precautionary or hazard mitigation measures, the HUD Field Offices shall require corrective work to mitigate potential adverse effects from the special conditions as may be necessary. Special conditions include rock formations, unstable soils or slopes, high ground water level, springs, or other conditions which may adversely effect a property. It shall be the builder's responsibility to assure proper design, construction and satisfactory performance where they are present.

(4) Access.

(i) Each property shall be provided with vehicular or pedestrian access by public or private streets. Private streets shall be protected by permanent easement.

(ii) Each living unit shall have a means of access such that it is unnecessary to pass through any other living unit.

(iii) The rear yard shall be accessible without passing through any other living unit.

(iv) For a row type dwelling, the access may be by means of alley, easement, passage through the dwelling, or other means acceptable to the HUD Field Office.

(c) Site design.

(1) General.

(i) A site design shall be provided which includes an arrangement of all site facilities necessary to create a safe, functional, healthful, durable and energy efficient living environment.

(ii) These site design standards are applicable only in communities which have not adopted criteria for site development applicable to one and two family dwellings.

(iii) Single family detached houses situated on individual lots located on existing streets with utilities need not comply with the requirements of 200.926d(c)(2), (3) and (4)(ii).

(2) Streets.

(i) Existing or proposed streets on the site shall connect to private or public street and shall provide all-weather access to all building for essential and emergency use, including access for deliveries, service, maintenance and fire equipment.

(ii) Streets shall be designed for dedication for public use and maintenance or, when approved by the HUD Field Office, may be retained as private streets where protected by permanent easements.

(3) Dedication.

Utilities shall be located to permit dedication to the local government or appropriate public body.

(4) Drainage and flood hazard exposure.

(i) Residential structures with basements located in FEMA-designated areas of special flood hazard. The elevation of the lowest floor in structures with basements shall be at or above the base flood level (100 year flood level) required for new construction or substantial improvement of residential structures under regulations for the National Flood Insurance Program (NFIP) (see 44 CFR 60.3 through 60.6), except where variances from this standard are granted by communities under the procedures of the Federal Emergency Management Agency (FEMA) at 44 CFR 60.6(a) or exceptions from this NFIP standard for basements are approved by FEMA in accordance with procedures at 44 CFR 60.6(c).

(ii) Residential structures without basements located in FEMA-designated areas of special flood hazard. The elevation of the lowest floor in structures without basements shall be at or above the FEMA-designated base flood elevation (100 year flood level).

(iii) Residential structures located in FEMA-designated "coastal high hazard areas". (A) Basements or any permanent enclosure of space below the lowest floor of a structure are prohibited.

(B) Where FEMA has determined the base flood level without establishing stillwater elevations, the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) and its horizontal supports shall be at or above the base flood level.

(iv) "Critical Actions" as defined in 24 CFR 55.2(b)(2). The lowest floor of a structure (including the basement and all mechanical, electrical, and service equipment) shall be at or above the FEMA-designated 500 year frequency flood elevation. "Critical Actions" located in FEMA-designated "floodways" (as defined in 24 CFR 55.2(b)(4)) and "coastal high hazard areas" (as defined in 24 CFR 55.2 (b)(1)) are prohibited.

(v) Streets. Streets must be usable during runoff equivalent to a 10 year return frequency. Where drainage outfall is inadequate to prevent runoff equivalent to a 10 year return frequency from ponding over 6 inches deep, streets must be made passable for commonly used emergency vehicles during runoff equivalent to a 25 year return frequency except where as alternative access street not subject to such ponding is available.

(vi) Crawl spaces. Crawl spaces must not pond water or be subject to prolonged dampness.

(d) Special construction and product acceptance.

(1) Structural features of factory produced (modular or panelized) housing or components.

(i) For factory fabricated systems or components, HUD Handbook 4950.1, "Technical Suitability of Products Program Processing Procedures" shall apply.

(ii) The requirements of this Part shall apply to structural features, consisting of factory fabricated systems or components assembled either at the factory or at the construction site, if the total construction is covered by these standards and can be inspected on-site for determination of compliance.

(2) Non-structural or non-standard features.

These features include methods of construction, systems, sub-systems, components, materials and processes which are not covered by these requirements. See HUD Handbook 4950.1 for procedures to be followed in order to obtain acceptance of non-structural components or materials. See HUD Handbook 4910.1 Appendix F for a list of Use of Materials Bulletins. Products and methods shall conform to the appropriate Use of Materials Bulletin.

(3) Standard features.

These features include methods of construction, systems, sub-systems, components, materials and processes which are covered by national society or industry standards. For a list of standards to which compliance is required, see HUD Handbook 4910.1, Appendices C, E and F.

(e) Energy efficiency

All detached One and Two Family Dwellings and One Family Townhouses not more than three stories in height shall comply with the CABO Model Energy Code, 1992 Edition, Residential Buildings, except for Sections 101.3.1, 101.3.2, 104 and 105, but Section 101.3.2.2, Historic Buildings, shall remain, and including the Appendix, and HUD intermediate MPS Supplement 4930.2 Solar Heating and Domestic Hot Water Systems, 1989 edition.

(f) Water supply systems.

(1) General.

(i) Each living unit shall be provided with a continuing and sufficient supply of safe water under adequate pressure and of appropriate quality for all household uses. Newly constructed residential property for which a building permit has been applied for on or after June 19, 1988 from the competent authority with jurisdiction in this matter shall have lead-free water piping. For

purposes of these standards, water piping is "lead-free" if it uses solders and flux containing not more than 0.2 percent lead and pipes and pipe fittings containing not more than 8.0 percent lead. This system shall not impair the function or durability of the plumbing system or attachments.

(ii) The chemical and bacteriological standards of the local health authority shall apply. In the absence of such standards, the maximum contaminant levels of EPA shall apply. A water analysis may be required by either the health authority or the HUD Field Office.

(iii) Whenever feasible, connection shall be made to a public water system. When a public system is not available, connection shall be made to a community system which shall comply with HUD Handbook 4940.2.

(2) Individual Water Systems.

(i) The system should be capable of delivering a flow of 5 gpm over at least a 4 hour period.

(ii) Water that, to be potable, requires continuing or repetitive treatment to be safe bacterially or chemically shall also comply with the requirements of 24 CFR 203.52 or 24 CFR 234.64, whichever is applicable.

(iii) After installation, the system shall be disinfected in accordance with the recommendations or requirements of the local health authority. In the absence of a health authority, system cleaning and disinfection shall conform to the current EPA Manual of Individual Water Supply Systems.

(iv) Bacteriological or chemical examination of a water sample collected by a representative of the local or state health authority shall be made when required by that authority or the HUD Field Office.

(3) Location of wells.

(i) A well located within the foundation walls of a dwelling is not acceptable except in arctic

or subarctic regions.

(ii) Water which comes from any soil formation which may be polluted, contaminated, fissured, creviced or less than 20 ft. below the natural ground surface is not acceptable, unless acceptable to the local health authority.

(iii) Individual water supply systems are not acceptable for individual lots in areas where chemical soil poisoning has been or is practiced if the overburden of soil between the ground surface and the water bearing strata is coarse grained sand, gravel, or porous rock, or is creviced in a manner which will permit the recharge water to carry the toxicants into the zone of saturation.

(iv) The following table shall be used in establishing the minimum acceptable distances between wells and sources of pollution located on either the same or adjoining lots. These distances may be increased by either the health authority having jurisdiction or the HUD Field Office.

DISTANCE FROM SOURCE OF POLLUTION

Source of Pollution	Minimum Horizontal Distance (ft.)
Property Line	10
Septic Tank	50
Absorption Field	100/1
Seepage Pit	100/1
Absorption Bed	100/1
Sewer Lines w/Permanent Watertight Joints	10
Other Sewer Lines	50
Chemically Poisoned Soil	25/3
Dry Well	50
Other	___/2

Note:

1 This clearance may be increased or decreased depending upon soil and rock penetrated by the well and aquifer conditions. The clearance may be increased in creviced

limestone and permeable strata of gravel and sand. The clearance may be reduced to 50 ft. only where the ground surface is effectively separated from the water bearing formation by an extensive, continuous impervious strata of clay, hardpan, or rock. The well shall be constructed so as to prevent the entrance of surface water and contaminants.

2 The recommendations or requirements of the local health authority shall apply.

3 This clearance may be reduced to 15 feet only where the ground surface is effectively separated from the water bearing formation by an extensive, continuous impervious strata of clay, hardpan, or rock.

(4) Well Construction

(i) The well shall be constructed so as to allow the pump to be easily placed and to function properly.

(ii) (A) All drilled wells shall be provided with a sound, durable and watertight casing capable of sustaining the loads imposed.

(B) The casing shall extend from a point several feet below the water level at drawdown or from an impervious strata above the water level to 12 in. above either the ground surface of the pump room floor. The casing shall be sealed at the upper opening to a depth of at least 15 feet.

(iii) Bored wells shall be lined with concrete, vitrified clay or equivalent materials.

(iv) The space between the casing or liner and the wall of the well hole shall be sealed with cement grout.

(v) The well casing shall not be used to convey water except under positive pressure. A separate drop pipe shall be used for the suction line.

(vi) When sand or silt is encountered in the water-bearing formation, the well shall either be compacted and gravel packed, or a removable strainer or screen shall be installed.

(vii) The surface of the ground above and around the well shall be compacted and graded to drain surface water away from the well.

(viii) Openings in the casing, cap, or concrete cover for the entrance of pipes, pumps or manholes shall be water tight.

(ix) If a breather is provided, it shall extend above the highest level to which surface water may rise. The breather shall be watertight, and the open end shall be screened and positioned to prevent entry of dust, insects, and foreign objects.

(5) Pump and equipment.

(i) Pumps shall be capable of delivering the volume of water required under normal operating pressure within the living unit. Pump capacity shall not exceed the output of the well.

(ii) Pumps and equipment shall be mounted to be free of objectionable noises, vibrations, flooding, pollution, and freezing.

(iii) The suction line shall terminate below the maximum drawdown of the water level in the well.

(iv) Horizontal segments of suction line shall be placed below the frost line in a sealed casing pipe or in at least 4 in. of concrete. The distance from suction lines to sources of pollution shall be not less than shown in the table at 200.926d(f)(3)(iv) of this section.

(6) Storage tanks.

(i) A pressure tank having a minimum capacity of 42 gallons shall be provided. However, prepressured tanks and other pressurizing devices are acceptable provided that delivery between pump cycles equals or exceeds that of a 42 gallon tank.

(ii) Tanks shall be equipped with a clean-out plug at the lowest point, and a suitable pressure

relief valve.

200.926e Supplemental information for use with the CABO One and Two Family Dwelling Code.

The following shall be used in Table No. R-201.2, Climatic and Geographic Design Criteria of the CABO One and Two Family Dwelling Code.

(a) Roof live loads.

Roof slope 3 in 12 or less: 20 psf
Roof slope over 3 in 12: 15 psf
Roof used as deck: 40 psf

(b) Roof snow load. The roof snow load shall be in accordance with Section 7 of ASCE 7-88 (Formerly ANSI A58.1).

(c) Wind pressures. The minimum Design Wind Pressures (net pressures) set forth below apply to areas designated as experiencing basic wind speeds up to and including 80 mph, as shown in ASCE 7-88, Figure 1, Basic Wind Speed Map. These pressures also apply to buildings not over 30 ft. in height above finish grade, assuming exposure C or defined in ASCE 7-88 (Formerly ANSI A58.1).

(1) Minimum design wind pressure criteria.

(i) Buildings (for overturning, racking or sliding); p = 20 psf.

(ii) Chimneys, p = 30 psf.

(iii) Exterior walls, p = 15 psf inward or outward. Local pressure at corners of walls shall be not less than p = 30 psf outward. These local pressures shall not be included with the design pressure when computing overall loads. The pressures shall be applied perpendicularly outward on strips of width equal to 10 percent of the least width of building.

(iv) Partitions, p = 10 psf.

(v) Windows, p = 20 psf inward or outward.

(vi) Roof, p = 20 psf inward or outward.

Roofs with slopes greater than 6 in 12 shall be designed to withstand pressures acting inward normal to the surface, equal to the design wind pressure for exterior walls. Overhanging eaves, cornices, and ridges, 40 psf

upward normal to roof surface. These local pressures shall not be included with the design pressure when computing overall loads. The pressures shall be applied perpendicularly outward on strips of width equal to 10 percent of the least width of building. Net uplift on horizontal projection or roof shall not be less than 12 psf.

(2) Severe wind design pressures. If the construction is higher than 30 ft., or if it is located in an area experiencing wind speeds greater than 80 mph, higher design wind pressures than shown above are required. Use Section 6 of ASCE 7-88 for higher criteria and for determining where wind speeds greater than 80 mph occur. Pressures are assumed to act horizontally on the gross area of the vertical projection of the structure except as noted for roof design.

(d) Seismic conditions shall be in accordance with Section 9 of ASCE 7-88 (Formerly ANSI A 58.1-82).

(e) Subject to damage from: weathering. A jurisdiction's weathering region shall be as established by the map in ASTM C 62-88.

(f) Subject to damage from: frost line depth. Exterior wall footings or foundation walls including those of accessory buildings shall extend a minimum of 6 in. below the finished grade and, where applicable, the prevailing frost line.

(g) Subject to damage from: termites. "Yes" shall be used in locations designated as Very Heavy, Moderate to Heavy and Slight to Moderate. "No." shall be used in locations designated as None to Slight. The map for Termite Infestation Probability in Appendix A of CABO, One and Two Family Dwelling Code shall be used to determine the jurisdiction's region.

(h) Subject to damage from: decay. "Yes" shall be used in locations designated as moderate to severe and slight to moderate. "No." shall be used in locations designated as none to slight. The Decay Probability map in Appendix A of CABO, One and Two Family Dwelling Code shall be used to determine the jurisdiction's decay designation.

INDEX

A

B

C

E

F

G

O

P

R

S

T

Walks---------- 305 3-4

1994