CHAPTER XVII—WOOD CONSTRUCTION

SECTION 1700—GENERAL

1700.1—GENERAL

(a) The quality and design of wood members and their fastenings used for load supporting purposes shall conform to good engineering practice.

(b) All members shall be framed, anchored, tied and braced so as to develop the strength and rigidity necessary for the purposes for which they are used.

(c) Preparation, fabrication and installation of wood members and the glues, connectors, and mechanical devices for the fastening thereof shall conform to good engineering practices.

(d) The detailed requirements contained in this Chapter are based on sound engineering principles such as those in the Standards hereunder and are intended for light frame construction in general use for structures having light loads and closely spaced framing. Where additional structural requirements should be applied because of the nature of the structure, the Standards hereunder shall be accepted as good engineering practice.

(e) For heavily loaded or engineered timber construction, structural design based on the recommendations of the Standards hereunder shall be accepted as conformance with good engineering practice. Other sections of this Chapter which are applicable, shall apply to heavily loaded or engineered timber construction as well as light frame construction.

(f) For engineered plywood structural diaphragm design, Supplement to Chapter 17 shall apply.

National Lumber Manufacturers Association:

National Design Specification for Stress Grade Lumber and Its Fastenings—1965.

Wood Construction Data No. 5—Heavy Timber Construction Details—1960.

American Institute of Timber Construction:

Timber Construction Standards — AITC 100-65.
Inspection Manual — AITC 200-63.
Structural Glued Laminated Timber — CS 253-63.
AITC Timber Construction Manual — 1966.

American Plywood Association:

Design of Plywood Lumber Structural Assemblies—1963.
Design and Fabrication of Plywood Curved Panels—T64-740.
Design and Fabrication of Plywood Stressed Skin Panels—T64-370.
Design and Fabrication of Plywood Beams—T64-140.
Fabrication of Plywood Folded Plates—Specification No. FP-62-1963.
Plywood Folded Plate Design Method—Laboratory Bulletin No. 58-B-1958.
Design, Fabrication, Installation Details of Nailed Plywood Box Beams.
Plywood Gusset Truss Designs 64-650—64-660.
Plywood Rigid Frame Design Manual 62-170D.

1700.2—DETERMINATION OF REQUIRED SIZES

(a) All wood structural members shall be of sufficient size to carry the dead and required live loads without exceeding the allowable working stresses as contained in the Standards listed in Section 1700.1(f).

(b) Where applicable as determined by end use, allowable working stresses may be determined by "Machine Stress Rating" as approved by the American Lumber Standards Committee, or in accordance with ASTM D-2018-62T, "Determining Design Stresses for Load-Sharing Lumber Members".

(c) Where minimum sizes of lumber members are shown herein, they shall be construed as meaning nominal sizes. American Lumber Standard dressed sizes shall be accepted as minimum net sizes conforming to nominal sizes. Computations to determine the required sizes of members shall be based on the net dimensions (actual size) and not the nominal sizes.

(d) For convenience, nominal sizes may be shown on the plans. If rough sizes or finished sizes greater or smaller than American Lumber Standard dressed sizes are to be used, computations may be predicated upon such actual sizes, provided they are specified on the plans or in a statement appended thereto.

1700.3—QUALITY OF MATERIALS

(a) All lumber used for load supporting purposes shall be identified by the Grade Mark of an approved Lumber Grading or Inspection Bureau or agency approved by the Board of Review of the American Lumber Standards Committee. Exception: Lumber that is rough sawn, pressure treated or lumber thicker than two inches (2") may be identified by a certification of inspection in lieu of Grade Marking.

(b) Structural glued laminated timber shall be manufactured and identified as required in the Commercial Standard for *Structural Glued Laminated Timber CS 253-63*.

(c) All *plywood* when used structurally (including among others, used for siding, roof and wall sheathing, subflooring, diaphragms, and built-up members) shall conform to the performance standards for its type in Commercial Standard *CS45-60* Douglas Fir Plywood, *CS122-60* for Western Softwood Plywood, or *CS259-63* for Southern Pine Plywood. Each panel or member shall be identified for grade and glue type by the trade marks of an approved testing and grading agency. In addition, all Plywood when permanently exposed in outdoor applications shall be of Exterior type.

(d) Wood Shingles and/or shakes shall be identified by the grade-mark of a grading or inspection bureau or agency recognized as being competent.

(e) *Fiberboard* for its various uses shall conform to the Standards of *ASTM C208-60* and *ASTM C209-60. Fiberboard Nail-Base* sheathing shall conform to the Standards of *IBI Specification No. 2-1961.* Fiberboard insulating roof deck shall conform to the standards of IBI Specification No. 1-1963.

(f) *Hardboard* shall conform to commercial Standard *CS251-63* for Hardboard, and shall be identified as to Classification. Hardboard Siding shall be not less than ¼" thickness. Underlayment-Hardboard meeting strength requirements of 7/32" or ¼" Service hardboard that is planed or sanded on one side to a thickness of 0.215 plus or minus 0.005 inches.

(g) *Particleboard* shall conform to commercial Standard *CS236-66* for Mat-Formed Wood Particleboard and shall be identified by the Manufacturers as meeting the requirements of this Standard for the recommended use. Underlayment Particleboard shall be not less than one-quarter (¼) inch in thickness and shall be installed in accordance with the Manufacturer's instructions.

1700.4—MOISTURE CONTENT

All lumber members 2" and less in thickness shall contain not more than 19% moisture at the time of permanent incorporation in a building or structure.

SECTION 1701—CONSTRUCTION PRACTICES

1701.1—PREPARATION OF BUILDING SITE

(a) All building sites shall be graded so as to provide drainage under all portions of the building not occupied by basements or cellars.

(b) All stumps and roots shall be removed from the soil to a depth of at least twelve (12) inches.

1701.2—REMOVAL OF DEBRIS

After all work is completed, loose wood and debris shall be completely removed from all spaces under the building. All wood forms and supports shall be completely removed. Loose or casual wood shall not be stored in contact with the ground under any building.

1701.3—FOUNDATIONS

Foundations shall be designed and constructed in accordance with the provisions of Section 1302. Where spot piers are used, unless properly designed, spacing of such piers shall not exceed eight (8) feet center to center.

SECTION 1702—PROTECTION AGAINST DECAY AND TERMITES

1702.1—WOOD SUPPORTS EMBEDDED IN GROUND

Where wood is embedded in the ground for support of permanent structures, it shall have an approved pressure preservative treatment, except where continuously below the ground-water line or continuously submerged in fresh water.

1702.2—UNEXCAVATED SPACES

When wood joists or the bottom of wood structural floors without joists are closer than *18 inches*, or wood girders are closer than 12 inches to exposed ground located within the periphery of the building over crawl space or unexcavated areas, they shall be approved wood of natural decay resistance, or pressure treated wood.

1702.3—SILLS ON EXTERIOR WALLS

All sills which rest on concrete or masonry exterior walls and are less than *8 inches* from exposed earth shall be of approved wood of natural decay resistance or pressure treated wood.

1702.4—SLEEPERS AND SILLS ON CONCRETE SLAB

Sleepers and sills on concrete or masonry slabs which are in direct contact with the earth shall be of approved wood of natural decay resistance or pressure treated wood.

1702.5—BASEMENT POSTS

Wood posts or columns in basements shall be supported by piers projecting at least two inches above the finish floor and separated therefrom by an approved impervious barrier except when approved wood of natural decay resistance or pressure treated wood is used. Posts or columns used in damp locations below grade shall be of approved wood of natural decay resistance or pressure treated wood.

1702.6—GIRDERS ENTERING MASONRY WALLS

Ends of wood girders entering masonry or concrete walls shall be provided with a ½-inch air space on tops, sides and ends unless approved wood of natural decay resistance or pressure treated wood is used.

1702.7—CLEARANCE BETWEEN SIDING AND EARTH

Clearance between wood siding and earth on the exterior of a building shall be not less than six (6) inches.

1702.8—CRAWL SPACE VENTILATION

(a) Crawl spaces under buildings without basements shall be ventilated by approved mechanical means or by openings in the foundation walls. Openings will be arranged to provide cross-ventilation and shall be covered with corrosion resistant wire mesh of not less than ¼-inch nor more than ½-inch in any dimension. Such wall openings shall have a net area of not less than two square feet for each 100 linear feet of exterior wall, plus ⅓ square foot for each 100 square feet of crawl space; provided, when an approved vapor barrier is installed over the ground surface, the specified net area of openings may be reduced 50 percent.

(b) Where combustion equipment is installed within a crawl space, air for combustion shall be provided in accordance with Volume III.

1702.9—APPROVED WOOD OF NATURAL RESISTANCE

(a) Approved wood for natural resistance to decay shall be all heartwood of bald cypress, black locust, black walnut, catalpa, and cedars, chestnut, osage orange, red mulberry, redwood and white oak.

(b) Approved wood for natural resistance to termites shall be all heartwood of bald cypress, redwood or Eastern red cedar.

1702.10—APPROVED PRESSURE PRESERVATIVE TREATMENT

The Standards of the American Wood Preservers Association shall be deemed as "approved" in respect to pressure-treated lumber.

1702.11—APPROVED PRE-CONSTRUCTION SOIL TREATMENT

The Standards of the National Pest Control Association shall be deemed as "approved" in respect to pre-construction soil treatment for protection against termites.

1702.12—SPECIAL TERMITE PROTECTION

In territories where hazard of termite damage is known to be very heavy the Building Official may require floor framing of termite resistant wood, pressure treated wood, soil treatment or other approved methods of termite protection.

SECTION 1703—FIRE PROTECTION

1703.1—FIRESTOPPING

(a) Firestopping shall be provided to cut off all vertical and horizontal concealed draft openings. Firestopping shall be as indicated in this Section and as provided in Section 705.

(b) Firestopping, when of wood, shall be of not less than two (2) inch thickness and shall effectively fill all spaces for the entire width or depth of the framing or structural member.

(c) Firestopping, when of other materials as provided in Section 705, shall be securely and tightly fitted into place. In the case of spaces between chimneys and wood framing, such spaces shall be solidly filled with mortar or loose incombustible matter supported on non-combustible supports.

(d) Firestopping shall be installed in the following locations:

(1) In all stud walls, partitions and furred spaces at ceiling and floor levels.

(2) Around the top, bottom and side of sliding door pockets.

(3) Between stair stringers at least once in the middle of each run, at the top and the bottom, and between studs, along and in line with the adjoining run of stairs.

(4) Between chimneys, fireplaces and wood framing, except in the case of approved metal chimney installations as set forth in Chapter XXVII, Suspended or Metal Chimneys.

(5) In concealed spaces created by an assembly of floor or roof joists, firestopping shall be provided for the full depth of the joists at the ends and over the supports.

(6) Concealed attic spaces shall be divided into horizontal areas in accordance with Section 705.

1703.2—FIRE RESISTANCE RATINGS

When fire resistance ratings are specified by this Code, it shall be provided in conformance with the requirements of Volume IA, Fire Resistance Ratings.

1703.3—FIRE CUTS

Where joists, beams, or girders enter and terminate in a masonry wall, they shall be provided with a fire cut of 3 inches or provided with wall plate boxes of self-releasing type or approved hangers, and if located in a required fire resistance wall shall be separated from the opposite side of the wall by at least 4" of solid masonry.

SECTION 1704—FASTENINGS

1704.1—NAILING AND STAPLING REQUIREMENTS

The number and size of nails or staples connecting wood members shall not be less than those specified in Table 1704.1—Nailing Schedule. Where nails of a type other than those shown in the Table are used, the number and spacing shall be in accordance with the manufacturers instructions.

1704.2—OTHER FASTENINGS

Where framing anchors, clips, staples, glues, or other methods of fastening are used, they shall be installed in accordance with the manufacturers instructions.

SECTION 1705—FLOOR FRAMING

1705.1—SILLS ON FOUNDATIONS

Sills on continuous foundation walls shall be not less than 2 inches in thickness and shall be anchored thereto by ½-inch bolts spaced not more than 6 feet apart and which are embedded at least 6 inches in concrete or 15 inches in masonry units. Girders supported on piers shall be provided a true and even bearing surface. Except where wood of natural decay resistance or pressure treated wood is used an approved moisture barrier shall be provided between the sill and foundation wall.

1705.2—BEAMS AND GIRDERS

Beams and girders shall not exceed the span limitations set forth in Table 1705.2, provided that other species, grades or sizes may be used when design is in accordance with accepted engineering practice. Where two or more pieces of 2-inch lumber are nailed together to provide girders, the wide faces shall be vertical and the end joints shall occur over supports, provided that for a girder continuous over three or more supports the end joints may be staggered in adjacent pieces at one-fourth the distance from intermediate supports. Where a girder is spliced over the support an adequate tie shall be provided.

1705.3—FLOOR JOISTS

(a) Joists of a grade with an f value of 1200 and E value of 1,760,000 shall not exceed the span limitations set forth in Table 1705.3—Maximum Allowable Spans for Wood Joists and Rafters. Floor joists of other grades or of other sizes, may be used in accordance with "Maximum Spans for Joists and Rafters in Residential Construction," as published by National Lumber Manufacturers Association, February 1961; or *may be designed* in accordance with Section 1700.1(d) or 1700.2(a).

(b) Except where supported on a 1-by-4-inch ribbon strip and nailed to the adjoining stud, the ends of each joist shall have not less than 1½ inches of bearing on wood or metal nor less than 3 inches of masonry.

(c) Floor joists shall be supported laterally by bridging installed at intervals not exceeding 8 feet.

(d) Joists shall be supported laterally at the ends by solid blocks or diagonal struts except where the ends of joists are nailed to a beam (wood or steel with an attached nailer), header, band joists or to an adjoining stud.

(e) Notches on the ends of joists shall not exceed one-fourth the depth. Holes bored for pipes or cable shall not be within 2 inches of the top or bottom of the joist and the diameter of any such hole shall not exceed one-third the depth of the joist. Notches for pipes in the top or bottom of joists shall not exceed one-sixth the depth and shall not be located in the middle third of the span.

(f) Joists framing from opposite sides of a beam, girder or partition shall be lapped at least 4 inches and fastened, or the opposing joists shall be tied together in an approved manner.

(g) Joists framing into the side of a wood girder shall be supported by framing anchors, on ledger strips not less than 2 by 2 inches, or by other approved methods.

1705.4—FRAMING AROUND OPENINGS

Trimmer and header joists shall be doubled when the span of the header exceeds 4 feet. The ends of header joists more than 6 feet long shall be supported by framing anchors, joist hangers, or other approved methods unless bearing on a beam, partition or wall. Tail joists over 12 feet long shall be supported at header by framing anchors or on ledger strips not less than 2 by 2 inches.

1705.5—JOISTS SUPPORTING PARTITIONS

Bearing partitions parallel to joists shall be supported on beams, girders, walls, or other bearing partitions. Bearing partitions perpendicular to joists shall not be offset from supporting girders, walls or partitions more than the joist depth, unless such joists are of sufficient size to carry the additional load.

1705.6—SUBFLOORS

(a) Except as provided in Section 1705.6(b), all floor joists shall be covered with subflooring of any of the following types:

LUMBER

Joist Spacing*	Minimum Net Thickness For Lumber Placed	
	Perpendicular to Joists	Diagonally to Joists
24″	11/16″	3/4″
16″	5/8″	5/8″
12″	5/8″	5/8″

*Joints in subflooring shall occur over supports unless end-matched lumber is used, in which case each piece shall bear on at least two joists.

PLYWOOD

Plywood applied in accordance with the provisions of Table 1705.6(A) and fastened in accordance with Table 1704.1; proper grade of Plywood with exterior glue is required in areas subject to dampness such as slab on grade, kitchens and bathrooms.

1706.4—POST AND BEAM FRAMING

(a) Where post and beam framing is used in lieu of conventional stud and joist construction, the posts shall be located to support the beams above and shall not exceed the load limitations of the sizes listed in Table 1706.4.

(b) Intermediate framing shall be attached to the posts and braced in the manner specified in Section 1704.2(b).

1706.5—INTERIOR BEARING PARTITIONS

(a) Studs in one- and two-story buildings shall be not less than 2 x 4 inches with the wide face perpendicular to the partitions. In three-story buildings, studs in the first story shall be not less than 3 by 4 inches or 2 by 6 inches.

(b) Studs supporting floors shall be spaced not more than 16 inches, those supporting ceilings and roofs shall be spaced not more than 24 inches.

(c) Double studs shall be provided on each side of openings exceeding 3 feet in width, and triple studs shall be provided on each side of openings exceeding 6 feet in width.

(d) Headers shall be provided over each opening in bearing partitions. Headers shall not exceed the spans shown in Table 1706.3, or may be of solid lumber of equivalent cross-section. Where the opening does not exceed three feet, each end of the header shall be supported on a stud or framing anchor. Where the opening exceeds 3 feet in width each end of the header shall be supported on one stud and where the opening exceeds 6 feet, each end shall be supported by two studs.

(e) Studs shall be capped with double top plates installed to provide overlapping at corners and at intersections with exterior walls. End joints in double top plates shall be offset at least 24 inches. For platform frame construction, studs shall rest on a single bottom plate.

1706.6—INTERIOR NON-BEARING PARTITIONS

(a) Framing for non-bearing partitions shall be of adequate size and spacing to support the finish applied thereto in accordance with the manufacturers recommendations. In non-bearing walls and partitions, studs may be spaced not more than 28" o.c. and may be set with the long dimension parallel to the wall.

(b) Openings in the non-bearing partitions may be framed with single studs and headers.

1706.7—EXTERIOR WALL COVERINGS

Exterior wall coverings of other than the following shall be of a material approved for exterior use and shall be applied in accordance with the manufacturers recommendations when not otherwise covered by the Code.

(a) WEATHERBOARDING: Wood siding when in place shall have an average thickness of not less than five-eighths inch (⅝"). Siding of less than these dimensions may be applied, provided the outside face of the stud is covered with sheathing, as provided in Section 1706.2(c).

(b) WOOD SHINGLES OR SHAKES: Wood shingles or shakes attached to sheathing other than wood or plywood shall be secured with approved

mechanically-bonding nails or by corrosive resisting common nails on shingle nailing boards securely nailed to each stud with two (2) 8d nails. Wood shingles or shakes may be applied over fiberboard shingle backer and fiberboard sheathing with approved non-corrosion annular grooved nails or may be nailed directly to fiberboard nailbase sheathing with non-corrosion annular grooved nails. The minimum thickness of wood shingles or shakes between nailing boards shall be not less than three-eighths inches (⅜").

(c) PLYWOOD: Plywood shall be of the exterior type and shall have a thickness of three-eighths (⅜") inches, except as provided in Table 1705.6(c). All Plywood joints shall be backed solidly with nailing pieces not less than two (2) inches in width, unless wood or plywood sheathing is used, or joints are lapped horizontally, or otherwise made waterproof.

(d) Fiberboard Siding shall be medium density not less than one-half (½") nominal thickness.

(e) Hardboard Siding shall conform with the requirements of Section 1700.3(f).

(f) Asbestos Shingles attached to sheathing other than wood or plywood shall be secured with approved mechanically-bonding nails or by corrosion-resistive common nails on shingle nailing boards securely nailed to each stud with two (2) 8d nails, except that asbestos shingles may be attached directly to fiberboard nail-base sheathing with corrosion-resistive annular grooved nails. Asbestos shingles shall have a minimum thickness of five thirty-second (5/32") inches.

(g) MASONRY VENEER: Masonry veneer shall conform to the requirements of Chapter XIV—Masonry Construction. Brick or other unit veneers shall be backed with solid sheathing covered with waterproof building paper, except where the sheathing is water-repellant. Brick veneer shall be securely attached to the structure as required in Section 1414.4.

(h) STUCCO: Stucco or exterior plaster shall conform to requirements of Section 1807.

(i) METAL: Exterior wall coverings may be of formed metal not less than twenty-eight (28) U. S. Standard Gauge.

(j) SOLID MASONRY: Solid Masonry walls shall conform to requirements of Chapter XIV—Masonry Construction.

SECTION 1707—ROOF AND CEILING FRAMING

1707.1—CEILING JOIST AND RAFTER FRAMING

(a) Ceiling joists and rafters of a grade with an f value of 1200 and an E value of 1,760,000 shall not exceed the span limitation set forth in Table 1705.3—Maximum Allowable Spans for Joists and Rafters.

(b) Ceiling joists and rafters of other grades or of other sizes, may be used in accordance with "Maximum Spans for Joists and Rafters in Residential Construction", as published by the National Lumber Manufacturers Association, February 1961; or may be designed in accordance with Section 1700.1(d) or 1700.2(a).

(c) Where rafters meet to form a ridge, they shall be placed directly opposite each other and nailed to a ridge board of not less than 1-inch in thickness, and not less in depth than the cut end of the rafters.

(d) Ceiling joists and rafters shall be nailed to each other where possible and the assembly shall be nailed to the top wall plate in an adequate manner to secure the roof framing to the walls.

(e) Ceiling joists shall be continuous or where they meet over interior partitions, shall be securely joined to provide a continuous tie across the building.

(f) Where ceiling joists are not parallel to rafters, sub-flooring or metal straps attached to the ends of the rafters shall be installed in a manner to provide a continuous tie across the building.

(g) Valley rafters shall be doubled. Hip rafters may be single members. Valley and hip rafters shall be 2 inches deeper than jack rafters.

(h) Collar beams of 1 x 6 boards shall be installed in the upper third of the roof height to every third pair of rafters.

1707.2—TRUSSED RAFTERS

(a) Trussed rafters shall be designed in accordance with accepted engineering practice. Members may be joined by nails, glue, bolts, timber connectors or other approved framing devices.

(b) Where trusses are to support a finished ceiling, the deflection under live load shall not exceed 1/360.

(c) The Building Official may require seal of Architect or Engineer on any truss design.

1707.3—ROOF JOISTS

(a) Roof joists of a grade with an f value of 1200 and E value of 1,760,000 shall not exceed the span limitation set forth in Table 1705.3—Maximum Allowable Spans for Joists and Rafters. Roof joists of other grades, or of other sizes, may be used in accordance with "Maximum Spans for Joists and Rafters in Residential Construction", as published by the National Lumber Manufacturers Association, February 1961; or may be designed in accordance with Section 1700.1(d) or 1700.2(a).

(b) Joists shall be supported laterally at the ends by solid blocks or diagonal struts. Such bridging may be omitted where ends of joists are nailed to a header, band joist or to an adjoining stud.

1707.4—ROOF SHEATHING

(a) All rafters and roof joists shall be covered with sheathing as follows:

Lumber
Solid sheathing—Wood boards of ⅝ inch (net) minimum thickness
Spaced sheathing—Wood boards of ¾ inch (net) minimum thickness

Plywood
Applied in accordance with the provisions of Table 1705.6(A) and nailed in accordance with Table 1704.1.

Insulating Roof Deck
Fiberboard insulating roof deck not less than 1-inch nominal thickness.

(b) Joints in lumber sheathing shall occur over supports unless end-matched lumber or approved clips are used in which case each piece shall bear on at least two rafters or joists.

1707.5—PLANK AND BEAM ROOFS

Beams shall be supported on posts, piers or other beams and shall conform to Section 1705.2. Roof planks shall conform to Section 1705.7.

1707.6—ANCHORAGE OF ROOF FRAMING TO MASONRY WALLS

Wood roof construction which rests on masonry walls shall be anchored thereto in a manner equivalent to that specified in Section 1408.2.

1707.7—ACCESS TO ATTIC SPACE

Attic spaces shall be provided with an interior access opening not less than two (2) feet by three (3) feet. Access openings shall be readily accessible and provided with a lid or device that may be easily removed or operated.

1707.8—VENTILATION OF ATTIC SPACE

(a) Attic spaces shall be ventilated in accordance with the following: For gabled roofs, screened louvers shall be provided and the net area opening shall be not less than 1/300 of the area of the ceiling below.

(b) For Hip roofs, ventilation shall be provided in the eave soffit and near the peak, the net area of the inlet shall be not less than 1/900 and that of the outlet 1/1600 of the area of the ceiling below.

(c) For Flat roofs, blocking and bridging shall be arranged so as not to interfere with the movement of air. Such roofs shall be ventilated along the overhanging eaves, with the net area of opening being not less than 1/250 of the area of the ceiling below.

1707.9—ROOF COVERING

Any roof covering permitted in this Code may be applied to dwellings. (See Chapter VII—Fire Protection Requirements, Section 706, Roof Coverings). Whenever composition roofing is used, solid sheathing shall be applied.

Flashing—

Flashing shall be placed around openings and extensions of mechanical appliances or equipment through the roof and otherwise as necessary to provide adequate drainage.

SECTION 1708—FRAMING AROUND MASONRY CHIMNEYS AND FIREPLACES

1708.1—CHIMNEYS

(a) All wood beams, joists and studs shall be trimmed away from chimneys. Headers, beams, joists and studs shall be not less than 2 inches from the outside face of a chimney or from masonry enclosing a flue. Ends of wood girders may be supported on a corbeled shelf of a chimney in a dwelling, for domestic low type heat appliances and for building

heating equipment for heating a total volume of occupied space not to exceed 25,000 cubic feet, provided there is not less than 8 inches of solid masonry between the ends and the flue lining.

(b) A clearance of not less than 4 inches shall be provided between the exterior surface of chimneys for commercial and industrial type incinerators and combustible material.

(c) Combustible lathing, furring or plaster grounds shall not be placed against a chimney at any point more than 1½ inches from the corner of the chimney; but this shall not prevent plastering directly on the masonry or on metal lath and metal furring; nor shall it prevent placing chimneys for low heat appliances entirely on the exterior of a building against the sheathing.

(d) All spaces between chimneys and wood joists, beams or headers shall be firestopped by placing non-combustible material to a depth of one inch at the bottom of such spaces.

1708.2—FIREPLACES

(a) Headers, beams, joists and studs shall be not less than 2 inches from the outside face of a fireplace.

Headers supporting trimmer arches at fireplaces shall be not less than 20 inches from the face of the chimney breast. Trimmers shall be not less than 6 inches from the inside face of the nearest flue lining.

(b) Woodwork shall not be placed within 6 inches of a fireplace opening. Woodwork above and projecting more than 1½ inches from a fireplace opening shall not be placed less than 12 inches from the top of a fireplace opening.

(c) Woodwork shall not be placed within 4 inches of the back face of a fireplace.

(d) The clearance between woodwork and a factory-built fireplace approved as a result of tests by a nationally recognized testing laboratory need not comply with paragraph (c) of this section provided the factory-built fireplace is installed in accordance with the conditions of approval.

TABLE 1704.1—FASTENING SCHEDULE

Joist to sill or girder, toe nail	8d common	3
Bridging to joist, toe nail each end	8d common	2
Ledger strip	16d common	3 at each joist
1"x6" subfloor or less to each joist, face nail	8d common	2
Over 1"x6" subfloor to each joist, face nail	8d common	3
2" subfloor to joist or girder, blind and face nail	16d common	2
Sole plate to joist or blocking, face nail	16d common	16" o.c.
Top or sole plate to stud, end nail	16d common	2
Stud to sole plate, toe nail	8d common	4
Doubled studs, face nail	16d common	24" o.c.
Doubled top plates, face nail	16d common	16" o.c.
Top plates, laps and intersections, face nail	16d common	2
Continuous header, two pieces	16d common	16" o.c. along each edge
Ceiling joists to plate, toe nail	8d common	3
Continuous header to stud, toe nail	8d common	3
Ceiling joists, laps over partitions, face nail	16d common	3
Ceiling joists to parallel rafters, face nail	16d common	3
Rafter to plate, toe nail	8d common	3
1-inch brace to each stud and plate, face nail	8d common	2
1"x8" sheathing or less to each bearing, face nail	8d common	2
Over 1"x8" sheathing to each bearing, face nail	8d common	3
Built-up corner studs	16d common	o.c.
Built-up girders and beams	20d common	32" o.c. at top and bottom and staggered 2 ends and at each splice.
2-inch Planks	2 each bearing	16d common

TABLE 1704.1—FASTENING SCHEDULE (Continued)

Plywood Subflooring		
½"	6d Common, annular or spiral thread	6" o.c. edges and 10" o.c. intermediate
⅝", ¾"	8d Common or 6d annular or spiral thread	6" o.c. edges and 10" o.c. intermediate
1", 1⅛"	10d Common or 8d ring shank, annular or spiral thread	6" o.c. edges and 6" o.c. intermediate
½"	16 ga. galvanized wire staples, ⅜" minimum crown	4" o.c. edges and 7" o.c. intermediate
⅝"	1⅝" length	2½" o.c. edges and 4" o.c. intermediate
Plywood Roof and Wall Sheathing		
½" or less	6d Common	6" o.c. edges and 12" o.c. intermediate
⅝" or greater	8d Common	6" o.c. edges and 12" o.c. intermediate
5/16", ⅜", ½"	16 ga. galvanized wire staples, ⅜" minimum crown. Length of 1" plus plywood thickness	4" o.c. edges and 8" o.c. intermediate
⅝", ¾"		2" o.c. edges and 5" o.c. intermediate
½" Fiberboard Sheathing*	1½" Galvanized roofing nail 6d common nail	3" o.c. at edges 6" o.c. at other bearings
25/32" Fiberboard Sheathing*	1¾" Galvanized roofing nail 8d common nail	3" o.c. at edges 6" o.c. at other bearings
½" Gypsum Sheathing	12 gage 1¼" Large Head Corrosion-Resistive	4" o.c. at edges 8" o.c. at other bearings

*Fiberboard sheathing may be stapled using 16 gage galvanized staples 1⅛" long for ½" sheathing and 1½" long for 25/32" sheathing. Staples to have minimum crown of 7/16" and spaced 3" o.c. at edges and 6" o.c. at other bearing.

TABLE 1705.2
MAXIMUM UNIFORM LOADS (a) FOR BEAMS AND GIRDERS (b)
E=1,760,000 f=1200

Span (e) ft.	in.	Nominal Size (c) in.	Limited by Deflection (d) L/240 #/ft.	L/360 #/ft.	Determined by Bending (d) #/ft.	Span (e) ft.	in.	Nominal Size (c) in.	Limited by Deflection (d) L/240	L/360	Determined by Bending (d) #/ft.
6'	0"	4 x 4	261	174	176	13'	0"	4 x 4	—	—	—
		4 x 6	972	648	425			4 x 6	95	63	90
		4 x 8	2309	1539	755			4 x 8	227	151	161
		4 x 10	—	—	1211			4 x 10	465	310	258
7'	0"	4 x 4	164	109	130	14'	0"	4 x 4	—	—	—
		4 x 6	612	408	312			4 x 6	77	51	78
		4 x 8	1452	968	555			4 x 8	182	121	139
		4 x 10	2954	1969	890			4 x 10	369	246	222
8'	0"	4 x 4	111	74	99	15'	0"	4 x 4	—	—	—
		4 x 6	413	275	239			4 x 6	63	42	68
		4 x 8	974	649	425			4 x 8	149	99	121
		4 x 10	1977	1318	681			4 x 10	302	201	194
9'	0"	4 x 4	77	51	78	16'	0"	4 x 4	—	—	—
		4 x 6	287	191	189			4 x 6	—	—	60
		4 x 8	684	456	336			4 x 8	122	81	106
		4 x 10	1389	926	538			4 x 10	248	165	170
10'	0"	4 x 4	56	37	63	17'	0"	4 x 4	—	—	—
		4 x 6	212	141	153			4 x 6	—	—	53
		4 x 8	498	332	272			4 x 8	101	67	94
		4 x 10	1014	676	436			4 x 10	206	137	151
11'	0"	4 x 4	42	28	52	18'	0"	4 x 4	—	—	—
		4 x 6	159	106	126			4 x 6	—	—	—
		4 x 8	375	250	225			4 x 8	84	56	84
		4 x 10	761	507	360			4 x 10	174	116	135
12'	0"	4 x 4	—	—	—	19'	0"	4 x 4	—	—	—
		4 x 6	122	81	106			4 x 6	—	—	—
		4 x 8	288	192	189			4 x 8	72	48	75
		4 x 10	587	391	303			4 x 10	149	99	121

(a) Including weight of Beam
(b) For Solid Wood Beams
(c) For 2 Pieces of 2" lumber nailed together multiply load by .896
(d) Loads indicated are max. uniform loads in lbs. per linear ft. of beam

TABLE 1705.3
MAXIMUM SPANS* FOR JOISTS AND RAFTERS
(Based on a Grade Providing an E of 1,760,000 and an f of 1200)

Nominal Size	Spacing C to C	FLOOR JOISTS 40# L.L.	FLOOR JOISTS 30# L.L.**	CEILING JOISTS 20# Attic Storage	CEILING JOISTS No Attic Storage	LOW SLOPE ROOF JOISTS Finished Ceiling	LOW SLOPE ROOF JOISTS No Finished Ceiling	RAFTERS Heavy Roofing	RAFTERS Light Roofing
2 x 4	12			9 5	11 10			9 9	11 5
	16			8 5	10 9			8 5	9 10
	24			6 10	9 5			6 10	8 0
2 x 6	12	11 5	12 5	14 7	18 5	14 0	15 2	15 2	17 7
	16	10 1	11 4	13 1	16 9	12 2	13 1	13 1	15 4
	24	8 3	9 2	10 7	14 7	9 10	10 7	10 7	12 5
2 x 8	12	14 9	16 1	19 6	24 7	18 8	20 2	20 2	23 6
	16	13 6	14 9	17 5	22 4	16 2	17 5	17 5	20 4
	24	11 0	12 4	14 3	19 6	13 2	14 3	14 3	16 7
2 x 10	12	18 3	19 11	24 9	31 2	23 7	25 6	25 6	29 10
	16	16 9	18 3	22 1	28 3	20 5	22 1	22 1	25 9
	24	14 0	15 7	18 0	24 9	16 8	18 0	18 0	21 1
2 x 12	12	21 9	23 9			28 7	30 11		
	16	19 11	21 9			24 9	26 9		
	24	16 11	18 11			20 2	21 10		

*Span shall be considered the clear distance between supports, for rafters the distance shall be measured along the slope.
**Use a 10# heavier Liveload when plastered ceilings are used.

TABLE 1705.6A

ALLOWABLE SPANS FOR PLYWOOD FLOOR AND ROOF SHEATHING CONTINUOUS OVER TWO OR MORE SPANS AND FACE GRAIN PERPENDICULAR TO SUPPORTS[1]

Panel Identification Index[2,8]	Roof				Floor
	Maximum Span (Inches)		Loads (psf) Total Load	Load Live	Maximum Span[4] (Inches)
	Edges Blocked	Edges Unblocked			
12/0	12	12	130	100	0
16/0	16	16	75	55	0
20/0	20	20	55	45	0
24/0	24[5]	24	60	45	0
30/12	30	26	55	40	12[6]
32/16	32	28	50[3]	40	16[7]
36/16	36	30	50[3]	35[3]	16[7]
42/20	42	32	45[3]	35[3]	20[7]
48/24	48	36	40[3]	40	24

[1]These values apply for Structural I and II, Standard Sheathing and C-C grades only. Spans shall be limited to values shown because of possible effect of concentrated loads.

[2]Identification Index appears on all panels in the construction grades listed in footnote (1).

[3]For roof live load of 40 psf or total load of 55 psf, decrease spans by 13 percent or use panel with next greater identification index.

[4]Plywood edges shall have approved tongue and groove joints or shall be supported with blocking, unless one-fourth (1/4) inch minimum thickness underlayment is installed, or finish floor is 25/32" wood strip. Allowable uniform load based on deflection of 1/360 of span is 100 psf.

[5]32/16 Structural I, when continuous over one support, may be laid with face grain parallel to supports provided all panel edges are blocked or other approved type edge support is provided, the spacing of the supports does not exceed twenty-four inches (24") on center, and the live load does not exceed 30 pounds per square foot. For other grades, a thickness of five-eighths inch (5/8") is required.

[6]May be 16" if 25/32" wood strip flooring is installed at right angles to joists.

[7]May be 24" if 25/32" wood strip flooring is installed at right angles to joists.

[8]The first numeral denotes spans for roofs and second numeral for floors.

TABLE 1705.6B

ALLOWABLE SPANS FOR PLYWOOD COMBINATION SUBFLOOR-UNDERLAYMENT[1]

Plywood Continuous over Two or More Spans and Face Grain Perpendicular to Supports			
Species Groups	Maximum Spacing of Joists (inches)		
	16"	20"	24"
1	½"	⅝"	¾"
2, 3	⅝"	¾"	⅞"
4	¾"	⅞"	1"

[1]Applicable to Underlayment grade, C-C (Plugged) and all grades of sanded Exterior type plywood. Spans limited to values shown because of possible effect of concentrated loads. Allowable uniform load based on deflection of 1/360 of span is 100 psf. Plywood edges shall have approved tongue and groove joints or shall be supported with blocking, or plyclips, unless one-fourth (1/4) inch minimum thickness underlayment is installed, or finish floor is 25/32" wood strip. If wood strips are perpendicular to supports, thicknesses shown for 16" and 20" spans may be used on 24" spans.

TABLE 1705.6C

PLYWOOD EXTERIOR WALL COVERINGS

Panel thickness shall be not less than ⅜" nominal except for "303 Specialty Siding" panels which are grooved, striated, brushed, or have other surface texture. Average thickness of "303 Specialty Siding" panels after texturing shall be not less than 5/16".

Nailing of plywood shall be as indicated:

	Plywood[1] Thickness	Nail Size	Nail Type	Panel Edges	Nail-Spacing on Supports[2] Intermediate
Panel Siding	⅜"	6d	Non-corrosive, box or casing nails	6"	12" on each stud
	½" and Thicker	8d		6"	12" on each stud
Lap Siding	⅜"	6d	Non-corrosive, box or casing nails	4"	One nail per stud on widths 12" or less. 8" for widths greater than 12"
	½" and Thicker	8d			
303 Specialty Siding[3]	⅜"	6d	Non-corrosive, box or casing nails	6"	12" on each stud
	½"	8d		6"	12" on each stud
Texture 1-11[3]	⅝"	8d	Non-corrosive, box or casing nails	6"	12" on each stud

[1]Minimum edge distance of ⅜".

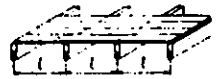
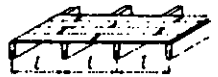
[2]Special Requirement: Nails on ship-lap edges ½" from exposed edge and slant driven towards it; do not set.

[3]In direct-to-stud applications 5-ply panels of ½" nominal thickness or more may be used over studs 24" o.c. if texturing does not penetrate through the face veneer. All other panels must be used over studs spaced not more than 16" o.c.

TABLE 1705.7

MAXIMUM ALLOWABLE SPANS* FOR 2-INCH PLANKS

E=1,760,000 f=1200

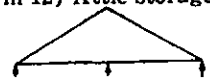
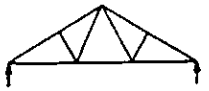
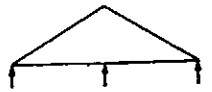
LOAD FACTOR		MAXIMUM SPANS FEET			
LIVE LOAD Psf	DEFLECTION LIMITATION	TYPE A SINGLE SPAN 	TYPE B CONTINUOUS OVER TWO EQUAL SPANS 	TYPE C CONTINUOUS OVER THREE EQUAL SPANS 	RANDOM LENGTH 
20	L/240	9′ 5″	11′ 10″	11′ 8″	10′ 4″
	L/360	8′ 3″	11′ 0″	10′ 2″	9′ 0″
30	L/240	8′ 3″	10′ 3″	10′ 2″	9′ 0″
	L/360	7′ 2″	9′ 8″	8′ 10″	7′ 10″
40	L/240	7′ 6″	9′ 2″	9′ 3″	8′ 2″
	L/360	6′ 6″	8′ 9″	8′ 1″	7′ 2″

*Computations for deflection are based on the live load only.

Computations for bending are based on the live load indicated, plus 10 Psf dead load.

TABLE 1706.3—
MAXIMUM SPANS FOR HEADERS*

In this table, headers consist of two pieces of nominal 2-inch framing lumber set on edge and nailed together. The span for the two pieces is expressed as a percentage of the maximum allowable span for floor joists of the same species and grade spaced 16 inches on centers and subjected to a live load of 40 pounds per square foot. Spans for floor joists are included in Section 1705.3(a).

Exterior Wall Openings			Bearing Partition Openings	
Rafters with Bearing Partition (Slope of 3 in 12 or less) No attic storage 	Trussed Rafters (Slope of 3 in 12 or less) No attic storage  Rafters with Bearing Partition (Slope over 3 in 12) Attic storage 	Trussed Rafters (Slope over 3 in 12) Attic storage 	Rafters with Bearing Partition (Slope of 3 in 12 or less) No attic storage 	Rafters with Bearing Partition (Slope over 3 in 12) Attic storage 
Buildings up to 26 ft. wide—1 story or 2nd story of 2-story buildings				
60%	45%	40%	50%	35%
Buildings up to 26 ft. wide—1st story of 1½ or 2 story buildings				
40%	35%	35%	35%	30%
Buildings 27 to 32 ft. wide—1 story or 2nd story of 2 story buildings				
55%	40%	35%	45%	35%
Buildings 27 to 32 ft. wide—1st story of 1½ or 2 story buildings				
35%	35%	35%	35%	30%

Note 1—Span for a header of two 2x4's should not exceed 2'-6" in bearing partitions under attic storage nor 3'-0" elsewhere.
Note 2—Example—Section 1705.3(a)—for the species and grade in question, may show a span of 14 feet for 2x8 floor joists spaced 16 inches on center under a 40-pound live load. If the factor from the table is 35%, the allowable span for a header consisting of 2 pieces of 2x8 of this grade and species would be 35% of 14 feet or 4 feet, 11 inches.

*Headers may be designed in accordance wtih Section 1700.1(d).

TABLE 1706.4
MAXIMUM COLUMN LOADS

COL. LENGTH	COL. SIZE	E-1,000,000		E-1,100,000		E-1,210,000		E-1,320,000		E-1,432,000		E-1,540,000		E-1,650,000		E-1,760,000		E-1,980,000	
		P/A	P	P/A	P	P/A	P	P/A	P	P/A	P	P/A	P	P/A	P	P/A	P	P/A	P
6-0	4 x 4	758	9960	833	10946	917	12049	1000	13140	1088	14231	1167	15334	1250	16425	1333	17516	1500	19710
	4 x 6	758	15456	833	16985	917	18698	1000	20390	1088	22082	1167	23795	1250	25488	1333	27180	1500	30585
8-0	4 x 4	427	5611	470	6176	517	6793	564	7411	611	8029	658	8646	705	9264	752	9881	846	11116
	4 x 6	427	8707	470	9588	517	10542	564	11500	611	12458	658	13417	705	14375	752	15333	846	17250
10-0	4 x 4	274	3600	301	3955	332	4362	362	4757	392	5151	422	5545	452	5939	482	6333	542	7122
	4 x 6	274	5587	301	6137	332	6769	362	7381	392	7993	422	8605	452	9216	482	9828	542	11051
12-0	4 x 4	190	2497	209	2746	230	3022	251	3298	272	3574	293	3850	314	4126	335	4402	377	4954
	4 x 6	190	3874	209	4262	230	4690	251	5118	272	5546	293	5974	314	6402	335	6831	377	7687
14-0	4 x 4	140	1840	154	2024	169	2221	185	2431	200	2628	215	2825	231	3035	246	3232	277	3640
	4 x 6	140	2855	154	3140	169	3446	185	3772	200	4078	215	4384	231	4710	246	5016	277	5648
16-0	4 x 4	107	1406	117	1537	129	1695	141	1853	153	2010	164	2165	176	2313	188	2470	211	2773
	4 x 6	107	2182	117	2386	129	2630	141	2875	153	3120	164	3344	176	3589	188	3833	211	4302
18-0	4 x 4	84	1104	93	1222	102	1340	111	1459	121	1590	130	1708	139	1826	149	1958	167	2194
	4 x 6	84	1713	93	1896	102	2080	111	2263	121	2467	130	2651	139	2834	149	3038	167	3405
20-0	4 x 4	68	894	75	986	83	1091	90	1188	98	1288	105	1380	113	1485	120	1577	136	1787
	4 x 6	68	1387	75	1529	83	1692	90	1835	98	1998	105	2141	113	2304	120	2447	136	2778

Note 1—The values for P/A were computed from the formula $P/A = \frac{.30E}{(L/d)^2}$

The unit load for any column is not permitted to exceed the allowable unit stress in compression parallel to the grain c for the grade of lumber used, adjusted for load duration. If the P/A in the table is greater than the c for the species and grade of lumber used, multiply the value of c times the cross-sectional area for allowable P.

Note 2—The value d in the table is taken as the least dimension in inches for member given.

Note 3—The Maximum Column Loads are based on columns without lateral support for lengths shown.

SUPPLEMENT
TO
CHAPTER XVII

PLYWOOD DIAPHRAGMS

GENERAL

Plywood diaphragms (with exterior glue) may be used in resist horizontal forces in horizontal and vertical distributing or resisting elements, provided the deflection in the plane of the diaphragm, as determined by calculations, tests, or analogies drawn therefrom, does not exceed the permissible deflection of attached distributing or resisting elements.

Permissible deflection shall be that deflection up to which the diaphragm and any attached distributing or resisting element will maintain its structural integrity under assumed load conditions, i.e., continue to support assumed loads without danger to occupants of the structure.

Connections and anchorages capable of resisting the design forces shall be provided between the diaphragms and the resisting elements. Openings in diaphragms which materially affect their strength shall be fully detailed on the plans, and shall have their edges adequately reinforced to transfer all shearing stresses.

Size and shape of diaphragms shall be limited as set forth in Table 1. In buildings of wood construction where rotation is provided for, transverse shear resisting elements normal to the longitudinal element shall be provided at spacings not exceeding 2 times the width for plywood diaphragms. In masonry or concrete buildings plywood diaphragms shall not be considered as transmitting lateral forces by rotation.

TABLE 1

MAXIMUM DIAPHRAGM DIMENSION RATIOS

Type	Horizontal Diaphragms Maximum Span-Width Ratios	Vertical Diaphragms Maximum Height-Width Ratios
Plywood, nailed all edges	4:1	3½:1
Plywood, blocking omitted at intermediate joints	4:1	2:1

Design

Horizontal and vertical diaphragms sheathed with plywood may be used to resist horizontal forces not exceeding those set forth in Table 2, or may be calculated by principles of mechanics without limitations by using values for nail strength and plywood shear strength given elsewhere in this code. Plywood thickness for horizontal diaphragms shall not be less

than set forth in Table 1705.6 for corresponding joist spacing and loads, except that one-fourth inch (¼") may be used where perpendicular loads permit.

All boundary members shall be proportioned and spliced where necessary to transmit direct stresses. Framing members shall be at least one and five-eighths inch (1⅝") wide. In general panel edges shall bear on the framing members and butt along their center lines. Nails shall be placed not less than three-eighths inch (⅜") in from the panel edge, not more than twelve inches (12") apart along intermediate supports, and six inches (6") along panel edge-bearings, and shall be firmly driven into the framing members. No unblocked panel less than twelve inches (12") wide shall be used.

When blocking is omitted and the panels are arranged so that load is applied perpendicular to the unblocked edges and to the continuous panel joints, shears shall not exceed two-thirds of the values given for six inch (6") nail spacing in Table 2. For other panel arrangements shears shall not exceed one-half of the tabulated values for six inch (6") nail spacing.

For flat or low-pitched roofs, including bowstring trussed roofs, not intended for walking traffic, blocking may be omitted with 5/16" plywood on rafters spaced 20" or less, with ⅜" plywood on rafters spaced 24" or less, and with ⅝" plywood on rafters spaced 32" or less.

TABLE 2

ALLOWABLE SHEAR FOR WIND ON BLOCKED DOUGLAS FIR OR SOUTHERN PINE DIAPHRAGMS
(Pounds per foot)

Minimum Plywood* thickness	Common Nail Size	Nail Spacing on all Plywood Edges†					
		For Framing Member 2-5/8 Inches or More in Width			For Framing Member Less than 2-5/8 Inches but not Less than 1-5/8 Inches in Width		
		6"	4"	3"	6"	4"	3"
5/16"**	6d	280	420	475	250	375	420
⅜"	8d	400	600	675	360	530	600
½"	10d	480	720	820	425	640	730

NOTE: For Douglas Fir and Southern Pine Framing (For other species adjust values accordingly).

†NOTE: When the force acting along either boundary or any line of continuous panel joints exceeds three-fourths of the tabulated value, nail spacing along such boundary or line shall be reduced by one-third.

*For Douglas Fir plywood grades having inner plies of species other than Douglas fir use next greater thickness or reduce shears one-fourth.

**These values may be used with ¼" plywood where perpendicular loads permit its use.

CHAPTER XVIII—LATHING, PLASTERING AND GYPSUM WALLBOARD

SECTION 1800—GENERAL

1801—SCOPE

(a) Lathing, plastering and wallboard application shall be done in the manner and with the materials specified in this Chapter, and when required for fire protection shall also comply with the provisions of Chapter XIX.

(b) The Building Official may require inspection of the lathing before the plaster is applied.

(c) The Building Official may require that test holes be made in the wall for the purpose of determining the thickness and/or proportioning of the plaster, provided the permit holder has been notified 24 hours in advance of the time of making such tests.

(d) Joint treatment of gypsum wallboard shall not be applied until the wall board application has been inspected and approved by the Building Official.

SECTION 1802—MATERIALS

Materials	Designation
Aggregate	
Sand—Shall be washed and when used with portland cement for scratch coat plastering the amount of sand retained on a No. 16 sieve shall be not less than 10% or more than 40%.	ASTM C 35-62
Perlite	ASTM C 35-62
Vermiculite	ASTM C 35-62
Gypsum Plasters	ASTM C 28-63
Lime—Special Finishing Hydrated Lime Type "S"	ASTM C206-49
Quicklime for structural purposes (Lime putty shall be made from quicklime or hydrated lime and shall be prepared in an approved manner.)	ASTM C 5-59
Keene's Cement	ASTM C 61-62
Portland Cement	
Type I, II, or III	ASTM C150-64
Type I-A, II-A, or III-A	ASTM C175-64
EXCEPTION: Approved types of placticizing agents may be added to portland cement Type I or Type II in the manufacturing process, but not in excess of 12 percent of the total volume. Plastic or waterproofed cements so manufactured shall meet the requirements for portland cement as specified in ASTM C150-64 except in respect to the limitations on insoluble residue, air-entrainment, and additions subsequent to calcination.	

Materials	Designation
Masonry Cement, Type II	ASTM C 91-64
Portland Blast Furnace Slag Cement	ASTM C205-64T
	Type IS
	Type IS-A
Gypsum Lath	ASTM C 37-64
Metal and Wire Lath, Metal Accessories and Channels	ASA-A42.4-55
Gypsum Wallboard	ASTM C 36-64
Gypsum Backing Board	ASTM C442-63
Joint Reinforcing Tape	ASTM C474-64
and Adhesive Materials	ASTM C475-64

SECTION 1803—APPLICATION OF INTERIOR LATHING AND PLASTERING

(a) Interior lathing and furring shall be done in accordance with the procedures set forth in "American Standard Specifications for Interior Lathing and Furring" (ASA A42.4-1955).

(b) Interior gypsum plastering shall be done in accordance with the procedures set forth in "Standard Specifications for Gypsum Plastering" (ASA A42.1-1964) or the "Recommended Specifications—Gypsum Plastering" as published by the Gypsum Association. Portland cement plaster shall be in accordance with the provisions of "Standard Specifications for Portland Cement Plastering" (ASA A42.3).

SECTION 1804—APPLICATION OF EXTERIOR LATHING AND PLASTERING

(a) Exterior use of gypsum plaster shall be in strict conformance with the applicable requirements of "Recommended Specifications — Gypsum Plastering" published by the Gypsum Association and American Standards Association A42.4.

(b) Exterior use of portland cement plaster shall be in conformance with the applicable requirements of "Standard Specifications for Portland Cement Stucco" (ASA A42.2).

SECTION 1805—PNEUMATICALLY PLACED PORTLAND CEMENT

(a) Pneumatically placed portland cement plaster shall be a mixture of portland cement and sand, conveyed by air through a pipe of flexible tube, and deposited by air pressure in its final position.

(b) Rebound material may be screened and re-used as sand in an amount not greater than 25 percent of the total sand in any batch.

(c) Pneumatically placed portland cement plaster shall consist of a mixture of one part cement to not more than five parts of sand. Plasticity agents may be used as specified elsewhere in this Chapter. Except when applied to concrete or masonry, such plaster shall be applied in not less than two coats to a minimum total thickness of seven-eighths inch (⅞").

SECTION 1806—APPLICATION OF GYPSUM WALLBOARD

(a) Interior and exterior application of gypsum wallboard shall be done in accordance with the procedures set forth in "American Standard Specifications for the Application and Finishing of Wallboard (ASA A97.1-1965).

CHAPTER XIX—ALUMINUM CONSTRUCTION

SECTION 1901—GENERAL

The quality, design, fabrication and erection of aluminum used structurally in buildings or structures shall conform to good engineering practice, the provisions of this Chapter and other applicable requirements of the Code.

SECTION 1902—STRUCTURAL ALUMINUM CONSTRUCTION

(a) The design, fabrication and assembly of structural aluminum for buildings or structures shall conform to Specifications for Structures of Aluminum Alloys, Aluminum Construction Manual, Section A, of The Aluminum Association, May 1963 edition.

(b) The use of aluminum alloys, other than those listed in Specifications for Structures of Aluminum Alloys, Aluminum Construction, Section A, shall be permitted for structural members and assemblies, provided standards of performance not less than those required by the Specifications are substantiated to the satisfaction of the Building Official.

CHAPTER XX—GLASS

SECTION 2001—GLASS

2001.1—LABELING

Each light shall be labeled showing Type, Thickness and Manufacturer except where permanent marking is required. To identify glass with special impact resistance characteristics, laminated and full-tempered glass shall be identified permanently by the manufacturer; except labeling of heat-strengthened Spandrel glass may be omitted.

SECTION 2002—GLASS DIMENSIONAL TOLERANCES

There is established glass dimensional tolerances. Where minimum dimensions are required, the nominal values stated are subject to the tolerances shown in Federal Specification DDG-451a.

SECTION 2003—MAXIMUM AREAS—MINIMUM THICKNESS

2003.1—IMPACT LOADS

(a) For safety, glass in swinging doors, sliding doors, fixed side lights, glass panels, shower doors, tub enclosures and other openings subject to frequent exposure to accidental human impact, shall conform to the limits set forth in Table 2006. Glazed doors and openings not located in areas subject to frequent exposure to accidental human impact and those which have a glazing sill of 18 inches or more from the finished floor or whose least dimensions are less than 18 inches are exempt from this requirement.

(b) Where the risk of accidental breakage may involve extreme hazard to human safety (as in explosive process areas, in exposed skylights over public use areas, in underwater view windows, etc.), detailed shop drawings, specifications and rational analysis and/or test data assuring safe performance for the specific installation shall be prepared by engineers experienced in this work and shall be submitted for and receive, if warranted, formal approval by the Building Official.

2003.2—WIND LOADS

(a) For safety, glass or glass areas in exterior walls, in screens, in partitions and in other openings subject to wind loading shall be capable of safely withstanding the wind loads as shown in Section 1205.1 acting either inward or outward. In the case of regular plate or sheet glass supported on four sides, the design factor shall be not less than 2.5.

(b) Adjustment Factors for other types of glass are given in Table 2007.

SECTION 2004—GLASS SUPPORTS

(a) Glass supports such as sash members, glazing stops or glazing clips shall be considered firm when deflection of the support at design load does not exceed $\frac{1}{175}$ of the span.

(b) Where other than firm support on all sides is provided, (3 sides, 2 sides, cantilever, or highly flexible, for example), detailed shop drawings,

specifications and rational analysis and/or test data assuring safe performance for the specific installation shall be prepared by engineers experienced in this work and shall be submitted for and receive, if warranted, formal approval by the Building Official.

SECTION 2005—JALOUSIES (IMPACT, AND/OR WIND LOAD)

Thickness shall be not less than 7/32-inch. Length shall be not more than 36 inches. Edges shall be seamed. Other types may be considered only if detailed shop drawings, specifications and rational analysis and/or test data assuring safe performance for the specific installation shall be prepared by engineers experienced in this work and shall be submitted for and receive, if warranted, formal approval by the Building Official.

TABLE 2006

IMPACT LOADS—GLASS

Glass shall conform to these limits:

1. Glass less than single strength in thickness shall not be used.
2. If short dimension is larger than 24 inches, glass must be double strength or thicker.
3.

Glass Type	Individual Opening Area	Requirements
Regular plate, sheet or Rolled (annealed)	Over 6 square feet	Not less than 3/16" thick. Must be protected by a push-bar[1] or protective screen firmly attached on each exposed side*, if not divided by a muntin.[2]
Regular plate, sheet or rolled (annealed), surface sandblasted, etched, or otherwise depreciated	Over 6 square feet	Not less than 7/32" thick. Must be protected by a push-bar[1] or protective screen firmly attached on each exposed side*, if not divided by a muntin.[2]
Regular plate, sheet or rolled (annealed), obscure	Over 6 square feet	Not less than 3/16" thick. Must be protected by a push-bar or screen firmly attached on each exposed side*.
Laminated	Over 6 square feet	Not less than ¼" thick.

TABLE 2006—IMPACT LOADS—GLASS (Continued)

Glass Type	Individual Opening Area	Requirements
Fully tempered	Over 6 square feet	When test samples are fractured by application of a sharp impact through a center punch at a point ½" to 1" from an edge, the weight of individual fragments shall not exceed 0.15 ounces.
Wired	Over 6 square feet	Not less than ¼" thick.
All Glass Doors (Swinging)		Shall be fully-tempered glass.

[1]Shall be constructed in such a manner so as to limit the impact delivered to either glass surface.
[2]Shall comply with AAMA Standard.
[3]Building owners and tenants shall maintain push-bars and/or protective screens in safe condition at all times.

TABLE 2007

RELATIVE RESISTANCE TO WIND LOAD
(Assuming equal thickness)

Glass Type	Approximate* Relationship
Laminated	0.6
Wired Glass	0.5
Heat Strengthened	2.0
Fully Tempered	4.0
Metal Edge Double Glazing**	1.5
Rough-rolled Plate	1.0
Sandblasted	0.4
Regular Plate or Sheet	1.0

*Before using Wind Load Chart, divide the Design Wind Load from 1205.1 by the value shown here for the glass type involved.
**Use thickness of the thinner of the two lights, not thickness of unit.

WIND LOAD CHART

REQUIRED NOMINAL THICKNESS OF REGULAR PLATE OR SHEET GLASS

BASED ON MINIMUM THICKNESSES ALLOWED
IN FEDERAL SPECIFICATION DD-G-451a

DESIGN FACTOR = 2.5

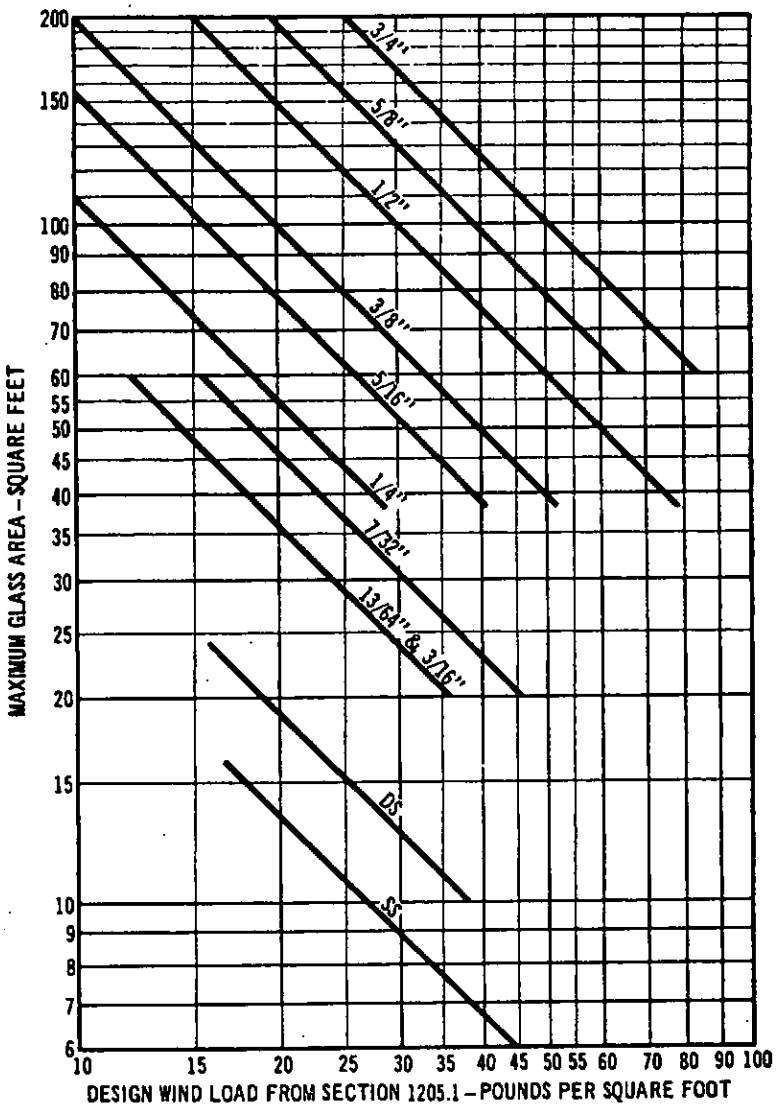


CHART APPLIES FOR RATIOS OF WIDTH - TO - LENGTH FROM 2:10 TO 10:10

CHAPTER XXI—PREFABRICATED CONSTRUCTION

SECTION 2101—GENERAL

Prefabricated construction shall conform to the requirements of this Code, except as otherwise provided for in this Chapter.

SECTION—2102—LOADS

Live, dead and wind load requirements shall conform to the requirements, as set forth in Chapter XII.

SECTION 2103—STRUCTURAL DESIGN

Where the size and spacing of framing members on materials are in conflict with, or not covered by this Code, they will be acceptable if the assembly meets the load requirements of this Code, provided they conform to the requirements as set forth for tests under Section 2104. The Building Official may require structural analysis by an Architect or Engineer.

SECTION 2104—TESTS

(a) Every manufacturer of prefabricated construction shall file with the Building Official, duplicate copies of a certificate from a recognized testing laboratory, which states that tests have been made on the particular type of prefabricated construction, and showing the live, dead and wind load capacities in pounds per square foot, uniformly distributed, together with a detailed physical description of the panels tested.

(b) Panels and other elements tested for loads shall sustain, without failure, for a period of 24 hours, a superimposed load equal to 2½ times the live load. Recovery within 24 hours, after removal of the full test load, shall be not less than seventy-five (75) percent of the observed deflection. The measured deflection of any panel or element under full live load shall be not over one three-hundred-and-sixtieth (1/360) of the clear span.

(c) When it is definitely ascertained by the Building Official that the requirements of this Code have been met, a permit shall be issued. A copy of all testing laboratory certifications shall be filed as a permanent record in the office of the Building Official.

SECTION 2105—PLYWOOD

Plywood of Douglas fir shall conform to U. S. Commercial Standard CS45-60. Plywood of other species, when used structurally, shall be identified as to veneer grade and glue type by an approved agency and shall meet the performance standards in U. S. Commercial Standard CS45-60 for its type.

CHAPTER XXII—PLASTICS

SECTION 2201—GENERAL

2201.1—SCOPE AND USES

(a) Plastic materials regulated by this chapter shall be those materials made wholly or principally from standardized plastics listed and described in the 1957 edition of "Technical Data on Plastics," published by the Manufacturing Chemists' Association.

(b) This Chapter pertains to the use of plastics in the following applications only:

Wall panels.
Glazing.
Roof panels.
Skylights.
Light-transmitting panels in monitors and sawtooth roofs.
Light-diffusing systems in ceilings.
Partitions.
Exterior veneers.
Awnings and similar shelters.
Greenhouses.
Signs and outdoor displays.

2201.2—APPROVED PLASTIC MATERIAL DEFINED

(a) For the purposes of this Chapter, an approved plastic shall be the material found to be marked or labeled or to carry an identification by the manufacturer of the material denoting its class of plastics as tested and approved by an independent testing laboratory.

(b) The basis of approval of such approved plastic material shall take into consideration the materials when tested by a recognized laboratory in accordance with ASTM Designation D635-63, under which the material shall not burn faster than 2.5 inches per minute, or ASTM Designation D568-61, under which the material shall not be consumed in less than 2 minutes, and ASTM Designation D374-57T. The Building Official may accept the classes of plastics as approved by the Committee on Compliance of the Southern Building Code Congress or those labeled by Underwriters Laboratories.

2201.3—CLASSES OF PLASTICS

(a) Class A plastic materials shall be those reinforced or unreinforced approved plastic materials which are self-extinguishing when tested in accordance with the test procedures described in 2201.2 above The Building Official may accept plastics having flame spread of 25 or less according to U.L. Label, tested in accordance with ASTM E84.

(b) Class B plastic materials shall be those approved plastic materials which are reinforced with glass fiber or other non-combustible material amounting to not less than 1.5 ounces per square foot and not less than 20 percent by weight of the plastic panel or sheet. The Building Official may accept plastics with flame spread of 75 or less U.L. Labeled and tested in accordance with ASTM E84.

(c) Class C plastic materials shall be those approved plastic materials which are reinforced with glass fiber or other non-combustible material amounting to not less than 10 percent by weight of the plastic panel or sheet. Plastics with flame spread of 200 or less, U.L. Labeled may be accepted by the Building Official.

(d) Class D plastic materials shall be approved plastic materials other than Class A, B or C, which meet the requirements of Section 2201.2.

2201.4—DESIGN LOADS

Design Loads shall conform to the provisions of Chapter XII of this Code.

SECTION 2202—WALL PANELS

2202.1—GENERAL

Wall panels shall mean plastic sheets used as a light-transmitting medium in exterior walls. Such panels may be installed only in wall areas in which openings are not required to be fire protected, and access panels shall be provided as required by the Code for structure and occupancy. (See Section 717.)

2202.2—CLASS A AND B PLASTICS

Class A and Class B plastic sheets may be used in wall panels in Types III, IV, V and VI buildings except in occupancy classifications E, D and H provided:

(a) The total area of plastic panels does not exceed 20 percent of the wall area in any one story of the structure.

(b) No section of plastic panels shall exceed one hundred feet (100') in length horizontally and no section shall exceed twelve feet (12') in height.

(c) In Types III, IV and V buildings, sections up to forty feet (40') in length shall be separated longitudinally by a section of conforming materials equal in width to 10 percent of the length of the section or four feet (4'), whichever is greater. Sections over forty feet (40') in length shall be separated by a section of approved non-combustible siding at least eight feet (8') in width.

(d) In Types III, IV and V buildings, parallel sections shall be separated vertically by a section of conforming materials at least eight feet (8') in height.

2202.3—CLASS C AND D PLASTICS

Class C and D plastics may be used as wall panels in locations and subject to the conditions specified for Class A and B plastics provided the area of such panels does not exceed 20 percent of the wall area in any one story of the structure and no section of such panels is over fifty feet (50') in length or eight feet (8') in height.

SECTION 2203—GLAZING OF UNPROTECTED OPENINGS

Doors, sash and framed openings may be glazed or equipped with transparent or translucent approved plastic materials, where such openings are

not required to be fire protected, provided that the area so glazed shall not exceed 20 percent of the wall area nor be located at a height greater than twenty feet (20') above grade level.

SECTION 2204—ROOF PANELS

2204.1—GENERAL

Transparent or translucent plastic panels may be used in roofs not required to have a fire-resistive rating and in all roofs where sprinkler protection is provided, except for Occupancy Classifications D, E and H, provided:

(a) That on structures or over occupancies required to have fire-retardant or non-combustible roofing, the panels conform to the slope of the roof which shall be at least four inches in twelve inches (4" in 12") or steeper, and each area of plastic panels shall be separated from every other area of plastic panels by at least eight feet (8') laterally and ten feet (10') along the slope of the roof.

(b) All plastic roof panels shall be attached directly to the building framework or shall be mounted individually in steel or other approved metal frames.

(c) Corrugated panels shall be pitched in the direction of the corrugations.

2204.2—AREA LIMITATIONS

Plastic sections installed on roofs required to have a fire-retardant or non-combustible roofing shall conform to the following area limitations:

(a) CLASS A PLASTICS: No section shall exceed three hundred square feet (300 sq. ft.) in area, and the aggregate area of such sections shall not exceed 20 percent of the floor area of the room or occupancy sheltered by the roof.

(b) CLASS B PLASTICS: No section shall exceed three hundred square feet (300 sq. ft.) in area, and the aggregate area of such sections shall not exceed 12½ percent of the floor area of the room or occupancy sheltered by the roof.

(c) CLASS C AND D PLASTICS: No section shall exceed one hundred square fe[illegible] (100 sq. ft.) in area, and the aggregate area of such sections shall not exceed 7½ percent of the floor area of the room or occupancy sheltered by the roof.

SECTION 2205—SKYLIGHTS

2205.1—GENERAL

Approved plastics may be used in skylights provided that:

(a) The skylight is not installed over a shaft or stairwell or over occupancy classifications E and H.

(b) The plastic is mounted at least four inches (4") above the roof on a non-combustible or metal clad curb of at least twelve inches (12") for industrial and commercial structures, and six inches (6") for residential structures.

(c) The plastic units are installed at least five feet (5') apart and not less than five feet (5') from any exterior wall, and in no case shall such units be installed within the distance from an exposure within which openings in walls are required to be fire protected.

(d) Flat or corrugated panels shall slope from the horizontal at least three inches in twelve inches (3" in 12") and the panel shall not exceed ten feet (10') from the bottom to the top of the inclined plane. Corrugations shall run with the inclined plane.

(e) Dome-shaped or curved units shall rise above the mounting flange a minimum distance equal to 10 percent of its maximum span or five inches (5"), whichever is the greater.

(f) The edges of the plastic material are enclosed in metal.

2205.2—CLASS A PLASTICS

Class A plastics may be used in skylights provided:

(a) The maximum area enclosed within the curb of units shall not exceed three hundred square feet (300 sq. ft.).

(b) The aggregate area of all such units shall not exceed 33⅓ percent of the floor area of the room sheltered by the roof in which the units are installed.

2205.3—CLASS B PLASTICS

Class B plastics may be used in skylights under the same conditions as allowed in subsection 2205.2 except that the aggregate area shall not exceed 25 percent of the floor area sheltered by the roof upon which it is erected.

2205.4—CLASS C AND D PLASTICS

Class C and D plastics may be used in skylights provided:

(a) The maximum area enclosed within the curb of units equipped with flat or corrugated plastic sheets not exceed one hundred square feet (100 sq. ft.).

(b) The aggregate area of all such units shall not exceed 20 percent of the floor area of the room sheltered by the roof in which the units are installed.

(c) Flat or corrugated units shall slope from the horizontal at least four inches in twelve inches (4" in 12") and shall not exceed eight feet (8') from the bottom to the top of the inclined plane.

SECTION 2206—LIGHT-TRANSMITTING PANELS IN MONITORS AND SAWTOOTH ROOFS

2206.1—GENERAL

Approved plastics may be used as light-transmitting panels in monitors and sawtooth roofs with or without sash, provided:

(a) The lower edge of the plastic material shall be at least six inches (6") above the horizontal surface of the roof.

(b) The areas of such plastic panels shall be separated from each other by a section of non-combustible material or by a section of the roofing material of the structure, said section to be equal in length to one tenth (1/10) of the length of the plastic section or five feet (5'), whichever is greater.

2206.2—CLASS A AND B PLASTICS

When Class A and B plastics are used the maximum length of a section of plastic panels shall not exceed one hundred feet (100') and the distance between the upper and lower edges shall not exceed ten feet (10').

2206.3—CLASS C AND D PLASTICS

When Class C and D plastics are used, the maximum length of a section of plastic panels shall not exceed fifty feet (50') and the distance between the upper and lower edges shall not exceed eight feet (8').

SECTION 2207—LIGHT-DIFFUSING SYSTEMS IN CEILINGS

2207.1—GENERAL

(a) Plastic light-diffusing systems in ceilings shall mean installations of plastic panels suspended below lighting fixtures for the purpose of diffusing light throughout a room or space and supported directly or indirectly from floor or roof construction. Plastic diffusers installed in surface mounted or recessed fixtures shall not be subject to the requirements of this section unless the aggregate area of the diffusers exceeds 15 percent of the area of the ceiling.

(b) No plastic light-diffusing system shall be installed in areas required to be equipped with automatic sprinklers unless appropriate tests by a recognized laboratory have shown that such system does not prevent effective operation of the sprinklers or unless sprinklers are located both above and below the light-diffusing system to give effective sprinkler protection.

(c) Plastic diffusers in systems in which the aggregate plastic area exceeds 30 percent of the ceiling area shall comply with Section 704.3 unless the plastic panels have heat distortion temperature of 225° F. or less (ASTM Method D648-56), and will fall from their mountings at an ambient temperature of at least 200° F. below the ignition temperature of the plastic material as shown in appropriate tests by a recognized testing laboratory. Such panels which exceed two (2) ounces per sq. ft. in weight shall not exceed 10 ft. in length, and such panels which weigh less than two (2) ounces per sq. ft. shall not exceed 25 ft. in length. In no case shall the weight of such panels be more than eight (8) ounces per sq. ft.

(d) In Type I, II, III and IV buildings all hangers and fasteners shall be of non-combustible material. Hangers shall be at least No. 12 U. S. Standard gauge galvanized wire or equivalent.

(e) The maximum temperature in the space between the panel and the ceiling shall not exceed the manufacturer's recommended maximum service temperature for the plastics employed in the panel.

2207.2—CLASS A PLASTICS

Class A plastics may be used for light-diffusing systems in ceilings in all types of buildings and occupancies, subject to approval of the Building Official.

2207.3—CLASS B, C AND D PLASTICS

Class B, C, and D plastics shall not be installed in required fire exits or corridors or in occupancies D, E, and H. In other rooms or spaces, panels of Class B, C and D plastics may be installed as light-diffusing systems provided the aggregate plastic area does not exceed 15 percent of the ceiling area.

SECTION 2208—PARTITIONS

2208.1—CLASS A PLASTICS

Where partitions may be of combustible construction, Class A plastics may be used for the construction of the entire partition.

2208.2—APPROVED PLASTICS IN LIEU OF PLAIN GLASS

Plastics may be used to provide the light-transmitting medium in the upper half of combustible partitions where plain glass is permitted, provided the area of plastic so installed does not exceed in the aggregate one-third (⅓) of the area of the partition in which installed.

2208.3—APPROVED PLASTICS IN MOVABLE PARTITIONS

Approved plastics may also be installed in openings in movable partitions made of metal or other non-combustible material, provided the area of plastic so installed does not exceed in the aggregate one-half (½) of the area of the partition in which installed.

SECTION 2209—EXTERIOR VENEER

Class A plastics may be used as exterior veneer in accordance with general requirements of Chapter XIV.

SECTION 2210—AWNINGS AND SIMILAR SHELTERS

Class A and B plastics may be used on awnings and similar structures in conformance with general provisions of Chapter XXVI.

SECTION 2211—GREENHOUSES

Class A and B plastics may be substituted for wire glass in the construction of greenhouses and Class A, B, C and D plastics may be used in lieu of plain glass.

SECTION 2212—SIGNS AND OUTDOOR DISPLAYS

The use of plastics in signs, outdoor displays and similar structures shall be governed by provisions of Chapter XXIII.

MISCELLANEOUS REQUIREMENTS

(Chapters XXII-XXVII)

CHAPTER XXIII—SIGNS AND OUTDOOR DISPLAYS

CHAPTER XXIV—SAFEGUARDS DURING CONSTRUCTION

CHAPTER XXV—FIRE-RESISTANCE STANDARDS FOR MATERIALS AND CONSTRUCTION

CHAPTER XXVI—USE OF PUBLIC PROPERTY

CHAPTER XXVII—CHIMNEYS, FIREPLACES AND VENTING SYSTEMS

CHAPTER XXIII—SIGNS AND OUTDOOR DISPLAYS

SECTION 2301—GENERAL

2301.1—OUTDOOR ADVERTISING DISPLAYS

Outdoor advertising displays, means any letter, figure, character, mark, plane, point, marquee sign, design, poster, pictorial, picture, stroke, stripe, line, trademark, reading matter or illuminated service, which shall be so constructed, placed, attached, painted, erected, fastened or manufactured in any manner whatsoever, so that the same shall be used for the attraction of the public to any place, subject, person, firm, corporation, public performance, article, machine or merchandise, whatsoever, which are displayed in any manner whatsoever out of doors. Every outdoor display shall be classified and conform to the requirements of that classification as set forth in this chapter.

2301.2—CLASSIFICATIONS

For the purpose of this chapter and the regulations and provisions thereof, outdoor advertising displays shall be classified into one of the following type signs:

(a) SPECTACULAR SIGNS—means an "Outdoor Advertising Display Sign" advertising copy usually animated, constructed of metal, wired for lights or luminous tubing, or both, with copy action controlled by the flashed circuit breakers or matographs and attached on an open face steel structure built especially for the purpose.

Spectacular signs may be built upon the ground, attached to a wall, or above the roof, or projecting from a wall, provided that such spectacular sign meets the requirements of the provisions of this Code governing ground, roof, wall, projection or marquee sign, depending upon where such sign is built, as set forth below.

Spectacular signs shall be illuminated with electricity only.

(b) GROUND SIGN—means an "Outdoor Advertising Display Sign" when such sign is supported by uprights or braces in or upon the ground.

(c) ROOF SIGN—means an "Outdoor Advertising Display Sign" erected, constructed, or maintained above the roof of any building.

(d) WALL SIGN—means an "Outdoor Advertising Display Sign" that shall be affixed to the wall of any building, when such sign shall project not more than twelve (12) inches from the building.

(e) PROJECTION SIGN—means an "Outdoor Advertising Display Sign" which is affixed to any building wall or structure and extends beyond the building wall, structure, building line or property line more than twelve (12) inches.

(f) MARQUEE SIGN—means a projecting sign attached to or hung from a marquee and said marquee shall be known to mean a canopy or covered structure projecting from and supported by a building, when such canopy or covered structure extends beyond the building, building line or property line.

(g) SHINGLE SIGN—means a projection or wall sign not over six (6) square feet in area, constructed of metal or other non-combustible material attached securely to a building and not projecting more than twenty-four (24) inches over public property.

2301.3—PERMITS REQUIRED

(a) No "Outdoor Advertising Display Sign" shall hereafter be erected, constructed, altered or maintained except as provided in this Code, until after permit for the same has been issued by the Building Official as required in Section 105 and the fee paid.

2301.3(b)—EXCEPTION

No permit fee shall be required for a shingle sign over a show window or door of a store or business establishment, announcing without display or elaboration, only the name of the proprietor and nature of the business; nor shall a permit be required for a ground sign advertising for sale or rent property, providing such sign is not over fifteen (15) feet square in area. (See Local Ordinance.)

2301.4—IDENTIFICATION OF SIGNS

Every Outdoor Advertising Display Sign hereafter erected, constructed or maintained, for which a permit is required shall be plainly marked with the name of the person, firm or corporation erecting and maintaining such sign and shall have affixed on the front thereof the number of permit issued for said sign by the Building Official.

2301.5—ANNUAL INSPECTION

It shall be the duty of the Building Official or his authorized agent to inspect every ground sign, roof sign, wall sign, and projection sign at least once annually.

2301.6—UNSAFE SIGNS

Should any sign become insecure or in danger of falling or otherwise unsafe in the opinion of the Building Official, the owner thereof, or the person or firm maintaining the same, shall upon written notice from the Building Official, forthwith in the case of immediate danger and in any case within ten (10) days, secure the same in a manner to be approved by the Building Official, in conformity with the provisions of this Code or remove such sign. If such order is not complied with in ten (10) days the Building Official shall remove such sign at the expense of the owner or lessee thereof.

2301.7—MAINTENANCE

All signs for which a permit is required, together with all their supports, braces, guys and anchors shall be kept in repair and unless of galvanized or non-corroding metal shall be thoroughly painted at least once every two years. The Building Official may order the removal of any sign that is not maintained in accordance with the provisions of this section. Such removal shall be at the expense of the owner or lessee.

2301.8—UNLAWFUL SIGNS

In case any sign shall be installed, erected, or constructed in violation of any of the terms of this Code the Building Official shall notify by

registered mail or written notice served personally, the owner or lessee thereof to alter such sign so as to comply with this Code or of the Zoning Regulations and to secure the necessary permit therefor, or to remove the sign. If such order is not complied with in ten (10) days the Building Official shall remove such sign at the expense of the owner or lessee thereof.

2301.9—LOCATION RESTRICTIONS

No Outdoor Advertising Display Sign shall be erected, constructed or maintained so as to obstruct any fire escape or any window or door or opening used as a means of egress or so as to prevent free passage from one part of a roof to any other part thereof. No sign shall be attached in any form, shape or manner to a fire escape, nor be placed in such manner as to interfere with any opening required for legal ventilation.

Combustible ground signs and roof signs, as defined in Section 2301.2(b) and (c), shall not be permitted in Fire District No. 1 and Fire District No. 2.

2301.10—SIGNS PROJECTING OVER PUBLIC PROPERTY

Signs projecting from a building or extending over public property shall maintain a clear height of nine (9) feet above the sidewalk and all such signs shall not extend more than eighteen (18) inches from the curbline.

SECTION 2302—STRUCTURAL REQUIREMENTS

2302.1—DESIGN AND STRESS DIAGRAMS REQUIRED

Before a permit shall be granted, the erector of every Outdoor Advertising Sign with the exception of shingle signs and light cloth temporary signs, shall submit to the Building Official a design and stress diagram or plan, containing the necessary information to enable the Building Official to determine that such sign complies with all the regulations of this Code.

2302.2—WIND PRESSURE

In the design and erection of all Outdoor Advertising Display Signs, the effect of wind shall be carefully considered. All signs shall be so constructed as to withstand the wind pressure as specified in Section 1205.

2302.3—WORKING STRESSES

(a) In all Outdoor Advertising Display Signs, the allowable working stresses shall conform with the requirements of Section 1205 of this Code, except as specified below.

(b) The allowable working stresses for steel and wood shall be in accordance with the provisions of Chapter XV—"Structural Steel" and Chapter XVII—"Wood."

(c) The working strength of chains, cables, guys or steel rods shall not exceed one-fifth (1/5) of the ultimate strength of such chains, cables, guys or steel rods.

SECTION 2303—CONSTRUCTION

2303.1—GROUND SIGNS

(a) No ground sign constructed entirely of wood material shall be at any point over twenty-four (24) feet above the ground level or located in Fire District Number 1 or 2, but when the facing of a ground sign is constructed entirely of sheet metal or other non-combustible material such ground sign may be erected within or without the fire districts and the supports, braces, battens, ornamental moulding, platform and decorative trim may be of wood material.

(b) Lighting reflectors may project beyond the face of the sign.

(c) The bottom coping of every ground sign shall be at least three (3) feet above the ground or street level, which space may be filled with platform decorative trim or light wooden construction.

(d) Every ground sign shall provide rigid construction to withstand wind action in all directions.

(e) Any person or persons, partnership, firm or corporation occupying any vacant lot or premises by means of a ground sign, shall be subject to the same duties and responsibilities as the owner of the lot or premises, with respect to keeping the same clean, sanitary, inoffensive, free and clear of all obnoxious substances and unsightly conditions on the ground in the vicinity of such ground sign on said premises for which they may be responsible.

(f) Wherever anchors or supports consist of wood embedded in the soil, the wood shall be pressure-treated with an approved preservative.

(g) Signs higher than 30 feet will be allowed provided they are designed to meet the same structural and fire protection requirements as buildings of equivalent height. Design calculations must be filed with the Building Official or the persons having jurisdiction.

2303.2—ROOF SIGNS

(a) All roof signs shall be so constructed as to leave a clear space of not less than six (6) feet between the roof level and the lowest part of the sign and shall have at least five (5) feet clearance between the vertical supports thereof; no portion of any roof sign structure shall project beyond an exterior wall.

(b) Every roof sign shall be constructed entirely of steel construction, including the upright supports and braces, except that only the ornamental moulding and battens behind the steel facing and the decorative lattice work may be of wooden construction.

(c) The bearing plates of all roof signs, shall distribute the load directly to or upon masonry walls, steel roof girders, columns or beams. The building shall be designed to avoid overstress of these members.

(d) No roof sign having a tight or solid surface shall be at any point over twenty-four (24) feet above the roof level.

(e) Open roof signs in which the uniform open area is not less than forty (40) percent of total gross area may be erected to a height of seventy-five (75) feet on buildings of Type I or Type II Construction and on other type buildings to a height of forty (40) feet, all such installed,

erected or constructed by iron, metal anchors, bolts, supports, chains, stranded cables, steel rods or braces and they shall be maintained in good condition as set forth in Section 2301.7.

2303.3—WALL SIGNS

(a) Wall signs attached to exterior walls of solid masonry, concrete or stone, shall be safely and securely attached to the same by means of metal anchors, bolts or expansion screws of not less than three-eighths (⅜) inch in diameter and shall be embedded at least five (5) inches. No wooden blocks shall be used for anchorage, except in the case of wall signs attached to buildings with walls of wood. No wall sign shall be supported by anchorages secured to an unbraced parapet wall.

(b) The surface face of all wall bulletins must be of sheet metal but the ornamental moulding surrounding same may be of wooden construction. Temporary cloth signs with wood frames may be kept in place for a period not exceeding thirty (30) days.

2303.4—PROJECTING SIGNS

(a) All projecting signs shall be constructed entirely of metal or other non-combustible material and securely attached to a building or structure by metal supports such as bolts, anchors, supports, chains, guys or steel rods. No staples or nails shall be used to secure any projecting sign to any building or structure.

(b) The dead load of projecting signs, not parallel to the building or structure and the load due to wind pressure shall be supported with chains, guys, or steel rods having net cross sectional dimension of not less than three-eighths (⅜) inch in diameter. Such supports shall be erected or maintained at angle of at least 45 degrees with the horizontal to resist the dead load and at an angle of 45 degrees or more with the face of the sign to resist the specified wind pressure. If such projecting sign exceeds thirty (30) square feet in one facial area, there shall be provided at least two such supports on each side not more than eight feet apart to resist the wind pressure.

(c) ANCHORAGE—All supports shall be secured to a bolt or expansion screw that will develop the strength of the supporting chain, guys or steel rod, with a minimum five-eighths (⅝) inch bolt or lag screw, by an expansion shield. Turn buckles shall be placed in all chains, guys or steel rods supporting projecting signs.

(d) Chains, cables, guys, or steel rods used to support the live or dead load of projecting signs may be fastened to solid masonry walls with expansion bolts or by machine screws in iron supports, but no such supports shall be attached to an unbraced parapet wall. Where the supports must be fastened to walls made of wood, the supporting anchor bolts must go through the wall and be plated or fastened on the inside in a secure manner.

(e) No projecting sign shall be erected on the wall of any building so as to project above the roof or cornice wall or above the roof level where there is no cornice wall; except that a sign erected at a right angle to the building, the horizontal width of which sign perpendicular to such wall does not exceed eighteen (18) inches may be erected to a height not exceeding two (2) feet above the roof or cornice wall or above the roof

level where there is no cornice wall. A sign attached to a corner of a building and parallel to the vertical line of such corner, shall be deemed to be erected at a right angle to the building wall.

2303.5—MARQUEE SIGNS

Marquee signs shall be constructed entirely of metal or non-combustible material and may be attached to, or hung from a marquee, and such signs when hung from a marquee shall be at least eight (8) feet at its lowest level above the sidewalk or ground level, and further, no such sign shall extend outside the line of such marquee. Marquee signs may be attached to the sides and front of a marquee, and such sign may extend the entire length and width of said marquee, provided such sign does not extend more than six (6) feet above, nor one (1) foot below such marquee, but under no circumstances, shall the sign or signs have a vertical dimension greater than eight (8) feet.

2303.6—SPECTACULAR SIGNS

All permits for spectacular signs shall be issued by the Building Official upon application therefor, after approval by the department having jurisdiction over electricity, upon payment of the required permit fee. The permit to erect or maintain a spectacular sign shall be good for one (1) year. The Building Official may issue a renewal of the permit issued hereunder upon the expiration thereof or within thirty (30) days thereafter upon the payment by the applicant of a renewal fee and by surrendering the old permit, accompanied by satisfactory proof in the form of an affidavit that the sign is as safe as when originally licensed and that the wiring or piping of the same is in good condition. All spectacular signs shall be constructed of non-combustible materials.

SECTION 2304—USE OF PLASTIC MATERIALS

(a) Notwithstanding any other provisions of this Code, plastic materials which burn at a rate no faster than 2.5" per minute when tested in accordance with ASTM D635-63 shall be deemed approved plastics and may be used as the display surface material and for the letters and decorations and facings on signs and outdoor display structures, provided, that on the first fire district the structure of the sign in which the plastic is mounted or installed is incombustible.

(b) Individual plastic facings of electric signs shall not exceed 200 square feet in area.

(c) In no case shall the area of plastic on a display surface exceed 1,100 square feet.

(d) Letters and decorations mounted upon an approved plastic facing or display surface may be made of approved plastics.