CHAPTER 25
GYPSUM BOARD AND PLASTER

SECTION 2501
GENERAL

2501.1 Scope

2501.1.1 Provisions of this chapter shall govern the materials, design, construction and quality of gypsum and plaster.

Exception: Buildings and structures located within the High Velocity Hurricane Zone shall comply with the provisions of Sections 2507 through 2513.

2501.1.2 Lathing, plastering and gypsum construction 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 7.

2501.2 Inspection

2501.2.1 No plaster shall be applied until the lathing has been inspected and approved by the building official.

2501.2.2 The building official may require that test holes be made in the wall for the purpose of determining the thickness and proportioning of the plaster, provided the permit holder has been notified 24 hours in advance of the time of making such tests.

SECTION 2502
DEFINITIONS

For definitions, see Chapter 2.

SECTION 2503
MATERIALS

Materials used in construction involving gypsum board and plaster shall conform to Table 2503.

TABLE 2503
MATERIALS

MATERIALS	DESIGNATION
Accessories for Gypsum Wallboard and Gypsum Veneer Base	ASTM C 1047
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% nor more than 40%	ASTM C 35
Perlite	ASTM C 35
Vermiculite	ASTM C 35
Gypsum Plasters	ASTM C 28
Gypsum Veneer Plaster	ASTM C 587
Gypsum Veneer Base	ASTM C 588
Water Resistant Gypsum Backing Board	ASTM C 630
Bonding Compounds for Interior Plastering	ASTM C 631
Lime-Special Finishing Hydrated Lime Type "S"	ASTM C 206

(continued)

TABLE 2503 *(continued)*
MATERIALS

MATERIALS	DESIGNATION
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
Keene's Cement	ASTM C 61
Glass Mat Gypsum Substrate for Use as Sheathing	ASTM C 1177
Glass Mat Water-Resistant Gypsum Backing Board	ASTM C 1178
Portland Cement Type I, II, or III Type I-A, II-A, or III-A	ASTM C 150
Exception: Approved types of plasticizing agents may be added to portland cement Type I or II in the manufacturing process, but not in excess of 12% of the total volume. Plastic or waterproofed cements so manufactured shall meet the requirements for portland cement as specified in ASTM C 150 except in respect to the limitation on insoluble residue, air-entrainment and additions subsequent to calcination.	
Masonry Cement Type II	ASTM C 91
Portland Blast Furnace Slag Cement	ASTM C 595, Type IS-A
Gypsum Lath	ASTM C 37
Metal Lath	ASTM C 847
Exterior Soffit Board	ASTM C 931
Gypsum Wallboard	ASTM C 36
Gypsum Backing Board	ASTM C 442
Gypsum Sheathing Board	ASTM C 79
Predecorated Gypsum Board	ASTM C 960
Joint Reinforcing Tape and Adhesive Materials	ASTM C 474, ASTM C 475
Exterior Soffit Board	ASTM C 931
Steel Studs (for use with gypsum boards)	ASTM C 645
Steel Studs, Loadbearing (for use with gypsum boards)	ASTM C 955
Screws (for use with Framing covered with gypsum boards; types G, S and W)	ASTM C 1002
Screws (for loadbearing steel framing)	ASTM C 954

SECTION 2504
APPLICATION

2504.1 Interior lathing and plastering

2504.1.1 Installation of interior gypsum lathing and furring shall comply with ASTM C 841.

2504.1.2 Interior gypsum plastering shall comply with ASTM C 842.

2504.1.3 Portland cement plaster shall comply with ASTM C 926.

2504.2 Exterior lathing and plastering

2504.2.1 Exterior use of portland cement plaster shall comply with the application requirements of ASTM C 926.

2504.2.2 Installation of exterior lathing and framing shall comply with ASTM C 1063.

2504.3 Pneumatically placed portland cement plaster

2504.3.1 Pneumatically placed portland cement plaster shall be a mixture of portland cement and aggregate conveyed by air through a pipe or flexible tube, and deposited by air pressure in its final position.

2504.3.2 Rebound material may be screened and reused as aggregate in an amount not greater than 25% of the total sand in any batch.

2504.3.3 Pneumatically placed portland cement plaster shall consist of a mixture of one part cement to not more than five parts of aggregate. 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 7/8 inch (22.2 mm)

2504.4 Application of gypsum wallboard

2504.4.1 Interior and exterior applications and finishing of gypsum board, other than gypsum veneer base and plaster, shall be done in accordance with 701.5, 2506 or GA 216.

2504.4.2 Gypsum veneer base and veneer plaster shall be applied and finished in compliance with 701.5, 2506, or ASTM C 843 and ASTM C 844.

2504.4.3 Joint treatment of gypsum wallboard shall not be applied until the wallboard application has been approved by the building official.

2504.5 Application of steel studs

2504.5.1 Nonload-bearing steel framing shall be installed in compliance with the provisions of ASTM C 754.

2504.5.2 Load-bearing (transverse and axial) steel studs and related accessories shall be installed in compliance with the provisions of ASTM C 1007.

2504.6 Application of gypsum sheathing

2506.1 Gypsum sheathing shall be applied in accordance with 701.5, 2506, or ASTM C 1280.

SECTION 2505
ALLOWABLE PARTITION HEIGHTS

Composite nonbearing partitions of gypsum wallboard and steel studs shall be limited in height in accordance with ASTM C 754.

SECTION 2506
VERTICAL GYPSUM BOARD DIAPHRAGMS

2506.1 General

2506.1.1 Gypsum wallboard, gypsum sheathing and gypsum veneer base may be used on wood studs for vertical diaphragms if applied in accordance with 2506. Shear resisting values shall not exceed those set forth in Table 2506.

2506.1.2 All studs, top and bottom plates and blocking shall be nailed in accordance with Table 2506.

2506.1.3 The shear values tabulated shall not be cumulative with the shear value of other materials applied to the same wall. Cumulative allowable shear values for walls sheathed with more than one type of material shall be supported by engineering calculations or tests. The shear values may be doubled when identical materials applied as specified in 2506.3 are applied to both sides of the wall.

2506.2 Wall framing

2506.2.1 Framing for vertical diaphragms shall comply with 2308.2 for bearing walls. Studs shall be spaced no farther apart than 16 inches (406 mm) center-to-center. Marginal studs and plates shall be anchored to resist all design forces.

2506.2.2 The maximum allowable height-to-length ratio for the construction shall be 1 1/2:1.

2506.3 Application

2506.3.1 End joints of adjacent courses of gypsum board sheets shall not occur over the same stud.

2506.3.2 Where required in Table 2506, blocking having the same cross-sectional dimensions as the studs shall be provided at all joints that are perpendicular to the studs.

2506.3.3 The size and spacing of nails shall be as set forth in Table 2506. Nails shall be spaced not less than 3/8 inch (9.5 mm) from edges and ends of gypsum boards or sides of studs, blocking and top and bottom plates.

2506.3.4 Gypsum sheathing 4 ft (1219 mm) wide may be applied parallel or perpendicular to studs. Pieces 2 ft (610 mm) wide shall be as set forth in Table 2506.

2506.3.5 Gypsum wallboard or veneer base may be applied parallel or perpendicular to studs. Maximum allowable shear values shall be as set forth in Table 2506.

2506.4 Masonry and concrete construction. Gypsum board shall not be used in vertical diaphragms to resist forces imposed by masonry or concrete construction.

TABLE 2506
SHEAR CAPACITY FOR SHEAR WALLS OF LATH AND PLASTER, GYPSUM SHEATHING BOARD, AND GYPSUM BOARD WOOD-FRAMED WALL ASSEMBLIES

Type of Material		Thickness of Material (in.)	Wall-Construction[5]	Fastener Spacing[2] Max. (in.)	Shear Values[1] (lb/ft of wall) (plf)	Minimum Fastener Size[3,4]
Woven wire or expanded metal lath and portland cement plaster		7/8	Unblocked	6	180	No. 11 gage, 1 1/2" long, 7/16" head, or No. 16 gage staple having 7/8" long legs
Gypsum lath, plain or perforated		3/8 lath and 1/2 plaster	Unblocked	5	100	No. 13 gage, 1 1/8" long, 19/64" head, plasterboard glued nail
Gypsum sheathing board	2x8 ft	1/2	Unblocked	4	75	No. 11 ga 1 3/4" long, 7/16" head, diamond point, galvanized
	4 ft		Blocked[7]	4	175	
	4 ft		Unblocked	7	100	
	4 ft	5/8	Blocked	4/7[8]	200	6d galvanized or roofing nails
Gypsum wallboard, gypsum veneer base, or water-resistant gypsum backing board		1/2	Unblocked[6]	7	75	5d cooler or wallboard nails
			Unblocked[6]	4	110	
			Unblocked	7	100	
			Unblocked	4	125	
			Blocked[7]	7	125	
			Blocked[7]	4	150	No. 6-1 1/4" screws[9]
			Unblocked	8/12[8]	60	
			Blocked[7]	4/16[8]	160	
			Blocked[6,7]	4/12[8]	155	
			Blocked[7]	8/12[8]	70	
			Blocked[7]	6/12[8]	90	
		5/8	Unblocked[6]	7	115	6d cooler or wallboard nails
				4	145	
			Blocked[7]	7	145	
				4	175	
			Blocked[7] Two Ply	Base ply: 9 Face ply: 7	250	Base ply-6d cooler or wallboard nails Face ply-8d cooler or wallboard nails
			Unblocked	8/12[8]	70	No. 6-1 1/4" screws[9]
			Blocked	8/12[8]	90	

For SI: 1 inch = 25.4 mm, 1 plf = 14.5939 N/m.

Notes:

1. These shear walls shall not be used to resist loads imposed by masonry or concrete construction. Values shown are for short-term loading caused by wind or seismic loading. Values shown must be reduced 25 percent for normal loading.
2. Applies to nailing all studs, top and bottom plates, and blocking.
3. Alternate nails may be used if their dimensions are not less than the specified dimensions. Drywall screws may be substituted for the 5d, 6d (cooler) nails listed above: 1 1/4" Type S or W, #6 for 5d or 6d (cooler) nails.
4. Except as noted, shear values are based on a maximum framing spacing of 16 inches on center.
5. For properties of cooler nails, see ASTM C 514.
6. Denotes maximum framing spacing of 24 inches on center.
7. All edges are blocked, and edge nailing supports all panel edges.
8. First number denotes fastener spacing at the edges; second number denotes fastener spacing in the field.
9. Screws are Type W or S.

SECTION 2507
HIGH VELOCITY HURRICANE ZONES
LATHING

2507.1 General. Lath shall be gypsum, metal or wire lath, as set forth herein, and shall conform to the Standard Specification for Interior Lathing and Furring, ANSI A42.4.

2507.2 Gypsum lath. Gypsum lath shall conform to the Standard Specification for Gypsum Lath, ASTM C37.

2507.2.1 Gypsum lath shall be nailed to wood supports, at intervals not to exceed 5 inches (127 mm), with 13-gage galvanized or blued nails having 19/64 inch (7.5 mm) diameter flat heads (7.5 mm). Nails shall be not less than 1 1/8 inches (29 mm) long for 3/8 inch (9.5 mm) lath nor less than 1 1/4 inches (32 mm) for 1/2 inch (12.7 mm) lath. Each 16-inch (406 mm) width of lath shall be secured to each support with not less than five nails except that where fire-resistive-rated construction is not required, there shall not be less than four nails.

2507.2.2 Lath shall be secured to horizontal or vertical metal supports by means of approved special clips.

2507.2.3 The center-to-center spacing of wood supports shall not exceed 16 inches (406 mm) for 3/8 inch (9.5 mm) gypsum lath and shall not exceed 24 inches (610 mm) for 1/2 inch (12.7 mm) gypsum lath.

2507.2.4 The center-to-center spacing for gypsum lath applied to metal studs shall not exceed that set forth herein above for wood supports except that 3/8 inch (9.5 mm) gypsum lath may be applied to metal studs spaced 24 inches (610 mm) on centers where a minimum of 3/4-inch (19 mm), 3-coat plaster is applied over the lath.

2507.2.5 Lath shall be applied with face side out and with the long dimension at right angles to the framing members. Joints shall be broken in each course, except that end joints may fall on one support when such joints are covered with 3 inch (76 mm) wide strips of metal lath. Lath shall be butted together.

2507.2.6 Corner bead and inside angle reinforcing shall not be required.

2507.2.7 No interior lath shall be applied until the roof is on and the building is dried in.

2507.3 Metal and wire lath.

2507.3.1 Metal and wire lath and metal accessories embedded in the plaster shall be galvanized or otherwise rust-resistant by approved means. Weight tags shall be left on all metal or wire lath until approved by the building official.

2507.3.2 The weight of metal and wire lath and the spacing of supports shall conform to the requirements set forth in Table 2507.3.2.

2507.3.3 All metal lath shall be lapped 1 inch (25 mm) minimum.

2507.3.4 All attachments for securing metal lath, wire lath and wire fabric to supports shall be spaced not more than 6 inches (152 mm) apart, and side laps shall be secured to supports and be tied between supports at not to exceed 9 inches (229 mm) intervals.

TABLE 2507.3.2
WEIGHTS OF METAL AND WIRE LATH*

TYPE OF LATH	MINIMUM WGT. (lb per sq yd)	MAXIMUM SPACING OF SUPPORTS(In.)	
		For Walls	For Ceilings
F;at Expanded Metal Lath	2.5	16	0
Flat Expanded Metal Lath	3.4	16	16
Flat Rib Metal Lath	2.75	16	12
Flat Rib Metal Lath	3.4	19	19
3/8" Rib Metal Lath	3.4	24	24
Sheet-Metal Lath	4.5	24	24
Wire Lath	2.48	16	12
Wire Fabric	**	16	16

For SI: 1 sq yd = 0.8361 m^2.

* V-stiffened that expanded metal lath of equal rigidity and weight is permissible on the same spacings as 3/8" rib metal lath.

** Paper-backed wire fabric, No. 16-gage wire, 2" x 2" mesh, with stiffner.

2507.3.5 Metal and wire lath shall be attached to vertical wood supports with the equivalent of 4d galvanized or blue common nails driven to a penetration of at least 3/4 inch (19 mm) and bent over to engage not less than three strands of lath. Metal and wire lath shall be attached to ceiling joists or other horizontal wood supports with the equivalent of No. 11-gage, barbed, galvanized or blued nails 1 1/2 (38 mm) inches long having a head not less than 3/8 inch (9.5 mm) in diameter.

2507.3.6 Metal and wire lath shall be attached to horizontal and vertical metal supports with the equivalent of No. 8 galvanized sheet-metal screws.

2507.4 Non bearing lath and plaster partitions.

2507.4.1 Where reinforced plaster or pneumatically placed plaster partitions are used, they shall have vertical steel or iron channels with a depth of not less than one-third of the thickness of the partition and spaced not more than 24 inches (610 mm) on centers. The thickness of metal in the channels shall not be less than 16 U.S. standard gage or light gage steel studs.

2507.4.2 Hollow non-bearing partitions of reinforced plaster or pneumatically placed plaster shall have a shell thickness of not less than 3/4 inch (19 mm).

2507.4.3 Metal reinforcing shall be as set forth in Table 2507.3.2, and gypsum lath shall not be less than 3/8 inch (9.5 mm) in thickness. The minimum thickness of metal lath and plaster partitions shall be not less than 2 inches (51 mm) or 1/84 of the distance between supports.

2507.5 Suspended and furred plaster ceilings.

2507.5.1 General. Suspended or furred plaster ceilings shall be designed and constructed as set forth herein.

2507.5.2 Main runners. Main runners or carriers shall be rolled steel channels not less than the sizes and weights set forth in Table 2507.5.2.

A main runner shall be located not more than 6 inches (152 mm) from parallel walls to support the ends of cross furring. The ends of main runners at walls shall be supported by hangers located not more than 12 inches (305 mm) from such ends. Splices in main runners shall be lapped 12 inches (305 mm) and tied, each end, with double loops of No. 16-gage wire.

2507.5.3 Cross furring. Cross furring, or spacers, for various spacing of main runners or other supports shall be not less than as set forth in Table 2507.5.3.

2507.5.3.1 Cross furring shall be securely saddle-tied to the main runners by not less than two strands of No. 16 W and M gage galvanized wire or equivalent approved attachments. Cross furring shall be attached to joists or beams with double No. 14 W and M gage galvanized wire or equivalent approved attachments.

Splices in cross furring shall be lapped 8 inches (203 mm) and tied, each end, with double loops of No. 16-gage wire.

2507.5.4 Hangers. Hangers supporting suspended ceilings shall be not less than as set forth in Table 2507.5.4.

2507.5.4.1 Hangers shall be saddle-tied or wrapped around main runners to develop the full strength of the hangers. Hangers shall be fastened to or embedded in the structural framing, masonry or concrete. Lower ends of flat-strap hangers shall be bolted with 3/8 inch (9.5 mm) bolts to runner channels or bent tightly around corners and bolted to the main part of the hanger. Where the area of a plastered ceiling exceeds 100 square feet (93 m^2), suitable methods to resist uplift forces shall be provided for each 64 square feet (6 m^2) of ceiling.

TABLE 2507.5.2
SPANS AND SPACING OF MAIN RUNNERS

Minimum Size and Type	Maximum Span Between Hangers or Supports	Maximum Center-to-Center Spacing of Runners
3/4" -0.3 lb per ft	2'-0"	3'-0"
1 1/2" -0.475 lb per ft	3'-0"	4'-0"
1 1/2" -0.475 lb per ft	3'-6"	3'-6"
1 1/2" -0.475 lb per ft	4'-0"	3'-0"
1 1/2" -1.12 lb per ft	4'-0"	5'-0"
2" -1.26 lb per ft	5'-0"	5'-0"
1 1/2" x 1 1/2* x 3/16" angle	5'-0"	5'-0"

For SI: 1 in. = 25.4 mm; 1 lb/ft = 1.4882 kg/m.

TABLE 2507.5.3
SIZES OF CROSS FURRING IN SUSPENDED AND FURRED CEILINGS

Size and Type	Maximum Span Between Supports	Maximum Spacing
1/4" pencil rods	Up to 2'-0"	12"
3/4" channels	Up to 3'-0"	24"
3/4" channels	Up to 4'-0"	16"

For SI: 1 in. = 25.4 mm.

TABLE 2507.5.4
HANGERS SUPPORTING SUSPENDED CEILINGS

Ceiling Area Supported (Square Feet)	Minimum Size of Hanger
12.5	8-gage wire
16	6-gage wire
18	3/16" rod
22.5	1/4" rod
50	1" x 3/16" flat bar

For SI: 1 in. = 25.4 mm.

SECTION 2508
HIGH VELOCITY HURRICANE ZONES
PLASTER

2508.1 General.

2508.1.1 Gypsum plastering shall conform to the Standard Specification for Gypsum Plastering, ANSI A42.1.

2508.1.2 Plastering with gypsum, hardwall, lime or cement plaster shall be three-coat work when applied over metal and wire lath and shall be not less than two-coat work when applied over gypsum lath or gypsum block.

2508.1.3 Portland cement plaster shall not be applied directly to gypsum lath.

2508.1.4 In no case shall a brush coat be accepted as a required coat where three-coat work is required by this section.

2508.1.5 Grounds shall be installed to provide for the thickness of plaster, as set forth in Table 2508.1.5, as measured from the face of the lath.

TABLE 2508.1.5
REQUIRED THICKNESS OF
INTERIOR PLASTER

Type of Lath	Thickness of Plaster
Metal or wire lath	5/8" minimum
Gypsum lath	1/2" minimum

2508.1.6 If monolithic-concrete ceiling surfaces require more than 3/8 inch (9.5 mm) of plaster to produce desired lines or surfaces, metal lath or wire lath shall be attached thereto; except that special bonding agents approved by the building official may be used.

2508.1.7 The building official may require test holes to be made for the purpose of determining the thickness of plaster.

2508.2 Materials.

2508.2.1 Aggregates.

2508.2.1.1 Inorganic aggregates used for plaster and stucco shall conform to the Standard Specification for Inorganic Aggregates for Use In Gypsum Plaster, ASTM C 35, except that graduation of locally produced sand shall be such that the fineness modulus is between 1.20 and 2.35.

2508.2.1.2 Aggregates shall be quarried or washed in fresh water and shall contain not more than 1/20 of one percent salt, by weight.

2508.2.2 Gypsum. Gypsum plaster shall conform to the Standard Specification for Gypsum Plaster, ASTM C 28.

2508.2.3 Lime. Lime shall conform to the Standard Specification for Quicklime for Structural Purposes, ASTM C 5, and the Standard Specification for Special Finish Hydrated Lime, ASTM C 206.

2508.2.4 Keene's cement. Keene's Cement shall conform to the Standard Specification for Keene's Cement, ASTM C 61.

2508.2.5 Portland cement.

2508.2.5.1 Portland cement shall conform to the Standard Specification for Portland Cement, ASTM C 150.

2508.2.5.2 Approved types of plasticity agents may be added to portland cement in the manufacturing process or when mixing the plaster, but in no case shall the amount of the plasticity agent exceed 10 percent of the volume of cement in the plaster mixture.

2508.2.6 Masonry cement. Masonry cement shall be Type II and shall conform to the Standard Specification for Masonry Cement, ASTM C 91.

2508.3 Proportioning and mixing.

2508.3.1 Base coats. The proportions of sand, vermiculite or perlite to 100 lb (45.4 kg) of gypsum neat plaster shall not exceed the requirements in this section.

2508.3.1.1 Gypsum or hardwall plaster. Gypsum or hardwall plaster shall be proportioned in accordance with 2508.3.1.1.

2508.3.1.2 Wood-fiber gypsum plaster. Wood-fiber gypsum plaster for use on all types of lath shall be mixed with water only and shall be mixed in the proportion of one part of plaster to one part of sand, by weight, for use on masonry.

2508.3.1.3 Ready mixed plaster. Gypsum ready-mixed plaster shall be in the proportion of 100 lb (45.4 kg) of gypsum neat plaster to not more than 250 lb (113 kg) of sand; or when vermiculite or perlite is used as an aggregate, the proportions shall be 100 lb (45.4 kg) of gypsum neat plaster to not more than 2 1/2 cubic feet (0.07 m^3) vermiculite or perlite.

TABLE 2508.3.1.1
GYPSUM AND HARDWALL PLASTER

Application Method	Damp Loose Sand (lb)	Vermiculite or Perlite (cu ft)
TWO-COAT WORK (DOUBLE-UP METHOD)		
(1) Over gypsum lath	250	2 1/2
(2) Over Masonry[2]	300	3
THREE-COAT WORK		
(1) First (scratch) coat over lath	200[1]	2
(2) First (scratch) coat over masonry	300	3
(3) All second (brown) coats	300[1]	3

1 Except over monolithic concrete.

2 In lieu of the proportioning specified, the proportions may be 100 lb of gypsum neat plaster to not more than 250 lb of damp, loose sand or 2 1/2 cu ft of vermiculite or perlite, provided this proportioning is used for both scratch and brown coats.

2508.3.1.4 Portland-cement plaster. For three-coat work, the first two coats shall be required for the first two coats of exterior stucco. See Section 2509.

2508.3.1.5 Masonry cement plaster. For 2- or 3-coat work, all work shall be set forth in 2508.

2508.3.2 Finish coats for gypsum or lime plaster. The finish coats shall be mixed and proportioned in accordance with this section.

2508.3.2.1 Smooth white finish, mixed in the proportion of not less than one part gypsum gaging plaster to three parts lime putty, by volume, or an approved prepared gypsum trowel finish.

2508.3.2.2 Sand-float finish, mixed in the proportion of one-half part of Keene's Cement to two parts of lime putty and not more than four and one-half parts of sand, by volume, or an approved gypsum sand-float finish.

2508.3.2.3 Keene's-Cement finish, mixed in the proportion of three parts Keene's Cement to one part lime putty, by volume.

2508.3.2.4 Lime sand-float finish, mixed in the proportion of three parts lime putty to three parts sand, by volume.

2508.3.2.5 Finish coat for perlite or vermiculite aggregate plasters, mixed in the proportion of 1 cu ft (28 339 cc) of aggregate to 100 lb (45 kg) of unfibered gypsum plaster, or mixed according to manufacturer's specifications.

2508.3.3 Finish coat for Portland cement plaster. Finish coats for interior Portland-cement plaster shall be one of the following:

1. As required for the third coat of exterior stucco. See 2413.
2. A gaged cement plaster mixed in proportion of one part Portland cement to not more than 15 percent lime putty and not more than four parts of sand, by volume.

2508.3.4 Finish coat for masonry cement plaster. Finish coat for masonry cement plaster shall be as set forth in 2508.4.2.3.

2508.4 Application.

2508.4.1 Base coats.

2508.4.1.1 Gypsum plaster. The scratch coat shall be applied with sufficient material and pressure to form a full key or bond.

2508.4.1.1.1 For two-coat work it shall be doubled back to bring the plaster out to grounds and straightened to a true surface and left rough to receive the finish coat.

2508.4.1.1.2 For three-coat work, the scratch (first) coat shall be scratched to a rough surface. The brown (second) coat shall be applied after the scratch coat has set firm and hard, brought out to grounds, straightened to a true surface with rod and darby and left rough, ready to receive the finish (third) coat.

2508.4.1.1.3 The finish coat shall be applied to a practically dry base coat or to a thoroughly dry base coat which has been evenly wetted by brushing or spraying. The use of excessive water shall be avoided in the application of all types of finish coat plastering.

2508.4.1.2 Portland-cement plaster. The first two coats shall be as required for the first two coats of exterior stucco, except that the interval between the first and second coats shall be not less than 24 hours.

2508.4.1.3 Masonry cement plaster. Where masonry cement is the only cementitious material, the second coat may be applied to the base coat as soon as the base coat has attained sufficient strength and rigidity to support the second (finish) coat.

2508.4.2 Finish.

2508.4.2.1 Smooth white finish shall be applied over the base coat that has set for a period of not less than 24 hours and is surface-dry. Thickness shall be from 1/16 inch to 1/8 inch (1.6 to 3.3 mm).

2508.4.2.2 Sand-float finish shall be applied over the set base coat that is not quite dry.

2508.4.2.3 Keene's-Cement finish shall be applied over the set base coat that is not quite dry. Thickness shall be from 1/16 inch to 1/8 inch (1.6 to 3.3 mm), unless finish coat is marked off or is jointed; in which case, the thickness may be increased as required by depth of marking or jointing.

2508.4.2.4 The finish coat for interior portland-cement plastering shall be applied in the same manner as required for the third coat of exterior stucco, except that other types of finish coat may be applied as specified in 2413.

2508.4.2.5 The finish coat for lightweight aggregate plastering shall be from 1/16 inch to 1/8 inch (1.6 to 3.3 mm).

2508.4.3 Plaster on concrete.

2508.4.3.1 Monolithic-concrete surfaces shall be clean, free from efflorescence, damp and sufficiently rough to insure adequate bond.

2508.4.3.2 Gypsum plaster applied to monolithic-concrete ceilings shall be specially prepared bond plaster for use on concrete, to which only water shall be added. Gypsum plaster on monolithic walls and columns shall be applied over a scratch coat of bond plaster, or other bonding material, before it has set. The brown coat shall be brought out to grounds, straightened to a true surface and left rough, ready to receive the finish coat.

2508.4.3.3 Portland-cement plaster applied to interior concrete walls or ceilings shall conform to requirements for application to exterior concrete walls as specified in 2509.

SECTION 2509
HIGH VELOCITY HURRICANE ZONES
STUCCO

2509.1 General.

2509.1.1 Portland cement-based plaster shall be applied in accordance with ASTM C 926, excluding Table 4 of that standard.

2509.1.2 Stucco base and finish coats, where required to meet fire-resistance requirements, shall be mixed in proportion of at least one part portland cement to a maximum of two and one-half parts sand by volume.

2509.1.3 Approved manufacturing products may be used for base and finish coats.

2509.1.4 Materials. The materials of stucco shall conform to ASTM C 926.

2509.1.5 Admixtures.

2509.1.5.1 Plasticity agents shall be of approved types and amounts and, where added to Portland cement in the manufacturing process, no additions shall be made later.

2509.1.5.2 Color may be added to the finish coat in approved amounts.

2509.1.6 Application.

2509.1.6.1 Stucco applied to concrete or masonry to meet fire-resistance requirements shall consist of at least two coats, and the total thickness shall be not less than 1/2 inch (12.7 mm).

2509.1.6.2 Masonry surfaces on which all stucco is applied shall be clean, free from efflorescence, damp and sufficiently rough, or coated with an approved bonding agent, to insure proper bond.

2509.1.6.3 All concrete surfaces shall be coated with an approved bonding agent or shall be effectively roughened.

2509.1.6.4 The first coat shall be well forced into the pores of the masonry, shall be brought out to grounds, straightened to a true surface and left rough enough to receive the finish coat.

2509.1.6.5 The first coat shall be rodded and water-floated to a true surface approximately one-half the total thickness.

2509.1.6.6 The base coat shall be damp cured for a period of not less than 24 hours.

2509.1.6.7 In lieu thereof, the finish coat, where containing appropriate waterproofing or curing admixtures, may be applied as soon as the base coat has attained initial set and is sufficiently firm to receive the finish coat.

2509.1.6.8 The finish coat shall be applied over a uniformly damp but surface-dry base.

2509.1.6.9 Stucco shall be kept damp for a period of not less than 48 hours after application of the finish coat.

2509.1.6.10 In lieu thereof, the finish coat may contain appropriate approved waterproofing or curing agents.

2509.2 Stucco on walls other than concrete or masonry

2509.2.1 General. Stucco shall be as set forth in 2509.1.

2509.2.2 Moisture barrier. Wood shall be covered with 15-lb roofing felt, or other approved equally moisture-resisting layer, and metal reinforcement as set forth herein.

2509.2.3 Metal reinforcement.

2509.2.3.1 Stucco shall be reinforced with galvanized expanded metal weighing no less than 1.8 pounds per square yard (0.98 kg/m^2), or galvanized welded or woven wire-fabric weighing no less than 1 pound per square yd (0.54 kg/m^2).

2509.2.3.2 All metal lathing shall be lapped not less than 1 inch (25 mm).

2509.2.3.3 Metal reinforcement shall be furred out from the backing by an approved method.

2509.2.3.4 Fastenings into wood sheathing or wood framing shall be by galvanized nails, with heads not less than 3/8 inch (9.5 mm) in diameter, driven to full penetration, using a minimum of two nails per square foot (0.093 m^2), or by approved staples having equal resistance to withdrawal.

2509.2.3.5 The fastening of rib-lath to metal members shall be by #8 galvanized sheet-metal screws, using a minimum of two screws per square foot (0.093 m^2).

2509.2.4 Application.

2509.2.4.1 Stucco applied on metal lath shall be three-coat work applied to a total thickness of not less than 1/2 inch (12.7 mm) thickness except as required to meet fire resistance requirements.

2509.2.4.2 The first coat shall be forced through all openings in the reinforcement to fill all spaces and scored horizontally.

2509.2.4.3 The second coat shall be applied after the first coat has set sufficiently to provide a rigid backing.

2509.2.4.4 The third coat shall be applied as soon as the second coat has attained initial set.

2509.3 Pneumatically placed stucco.

2509.3.1 Pneumatically-placed stucco shall consist of a mixture of 1 part portland cement to not more than 5 parts sand, conveyed through a pipe or flexible tube and deposited by pressure in its final position.

2509.3.2 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.

2509.3.3 Plasticity agents may be used as specified in 2509.1.5.1.

SECTION 2510
HIGH VELOCITY HURRICANE ZONES GYPSUM BOARD PRODUCTS AND ACCESSORY ITEMS

2510.1 General.

2510.1.1 Gypsum wallboard products and related items and accessories to be used with or without the addition of plaster for partitions, walls and ceilings shall be as set forth in this section.

2510.1.2 Where required to be fire-resistive, such assemblies shall also comply with Chapter 7 of this code.

2510.2 Standards. The following standards are adopted as set forth in Chapter 35.

Standard Specification for the Application and Finishing of Gypsum Wallboard, ANSI A97.1.

Specification for Gypsum Wallboard, ASTM C 36.

Specification for General Requirements for Zinc-Coated (Galvanized) Steel Sheets, by the Hot-Dip Process, ASTM A 525.

Specification for Light-Gage Steel Studs, Runners, and Rigid Furring Channels, ASTM C 645.

Specification for Joint Treatment Materials for Gypsum Wallboard Construction, ASTM C 475.

2510.3 Gypsum wallboard.

2510.3.1 The gypsum wallboard shall comply with the standards set forth in 2510.2, and single or multiple system combinations shall be not less than 1/2 inch (12.7 mm) in thickness.

2510.3.2 The span between supports for gypsum wallboard shall be not more than 24 inches (610 mm) for 1/2 inch (12.7 mm) thick and 5/8 inch (17.1 mm) thick wallboard.

2510.3.3 Gypsum wallboard used in fire-rated assemblies shall be of a type for which test ratings are available.

2510.4 Wood studs and wood ceiling supports. Wood studs and wood ceiling supports shall comply with Chapter 23 (High Velocity Hurricane Zones).

2510.5 Steel studs, ceiling supports and track runners.

2510.5.1 Steel studs and runners used to construct fire-resistive walls or partitions shall be hot-dipped galvanized in accordance with ASTM A 525, coating designation G40, minimum and be of channel or "C" Type shape. The total thickness of the base metal plus coating shall not be less than 0.0184 inch (0.467 mm) unpainted and not less than 0.0194 inch (0.493 mm) if coated and painted. Studs and runners shall comply with ASTM C 645 and have a base metal thickness, before application of any coating, of not less than 0.0179 inch (0.455 mm). Structural properties of such studs and runners shall comply with ASTM C 645.

2510.5.1.1 Steel studs supporting wall hung plumbing fixtures shall be doubled or not less than 20 gage with a minimum effective moment of inertia equal to 0.864 $in.^4$ (360 m^4).

2510.5.1.2 Such studs shall be rigidly connected top and bottom to prevent significant end rotation or displacement.

2510.5.1.3 A horizontal member securely fastened to not less than two studs shall be installed for the attachment of each wall hung plumbing fixture.

2510.5.2 The unsupported height of partitions shall comply with the loads and deflections set forth in Chapter 16 (High Velocity Hurricane Zones) and where wallboard is suitably attached, the composite action may be accounted for in the design.

2510.5.3 Steel ceiling supports shall comply with 2507.5.

2510.5.4 Steel studs track runners and ceiling supports in walls, including curtain walls, shall comply with ASTM A 525.

Exception. Such members in interior nonload-bearing walls need not be galvanized but shall comply with ASTM C 645.

2510.6 Attachments.

2510.6.1 Attachments shall be as set forth herein and for fire-rated assemblies shall also conform to the material and conditions of the assembly tested.

2510.6.2 Attachment to wood supporting members shall conform to the standard set forth in 2510.2.

2510.6.3 Nails and screws attaching gypsum wallboard shall, without substantially fracturing the surface paper, be driven below the surface and spotted with finishing joint compound.

2510.6.4 Attachment to metal members shall be in accordance with 2510.6.4.1 through 2510.6.4.5.

2510.6.4.1 Gypsum wallboard shall be attached to metal members by self-drilling, self-tapping sheet metal screws.

2510.6.4.2 The spacing of screws attaching gypsum wallboard to metal studs and runners, shall be not more than 12 inches (305 mm) on center.

2510.6.4.3 Screw for attaching gypsum wallboard to metal studs shall be not less than 7/8 inch (22.2 mm) long for 1/2 inch (17.7 mm) wallboard or 1 inch (25.4 mm) long for 5/8 inch (17.1 mm) wallboard.

2510.6.4.4 Screws attaching gypsum wallboard shall be driven below the surface and spotted with finishing compound.

2510.6.4.5 Runners shall be fastened to the ceiling, contiguous walls and partitions and to the floor at intervals not exceeding 24 inches (610 mm) on center. Such attachment may be by nails penetrating the base material not less than 5/8 inch (17.1 mm) or by self-drilling, self-tapping sheet metal screws attaching metal to metal.

SECTION 2511
HIGH VELOCITY HURRICANE ZONES SUSPENDED AND FURRED CEILINGS

2511.1 General. Lath and plaster ceilings shall be as set forth in this Chapter.

2511.2 Suspended and furred ceilings, other than lath and plaster where providing fire protection shall comply with Chapter 7.

2511.3 Suspended and furred ceilings, other than lath and plaster, shall be suspended and supported in conformance with the conditions of fire-tests or, if not tested, as recommended by the manufacturer or as required for structural stability.

SECTION 2512
HIGH VELOCITY HURRICANE ZONES
ASBESTOS

2512.1 Asbestos cement shall not be permitted for use under this code.

SECTION 2513
HIGH VELOCITY HURRICANE ZONES
TILE

2513.1 Ceramic and portland cement floor tile shall be set on a concrete slab or on wood sheathing on wood joists protected by a waterproof membrane.

2513.2 Floor tile shall be set in a mortar bed of one part portland cement to three parts aggregate or otherwise bedded in an approved adhesive material.

2513.2.1 Ceramic and portland cement wall tile used in areas subject to frequent wearing shall be backed with masonry, stucco on wire lath or approved tile backer board.

2513.2.2 Wall tile used in areas not subject to frequent wearing shall be backed by a cladding having the rigidity of stucco on wire lath and shall be bedded in cement mortar or other approved adhesive material.

2513.3 Portland cement or other porous tile shall be soaked in water not less than 1 hour before placing.

2513.4 Built-in tubs with overhead showers shall have waterproof joints between the tub and the wall and floor.