

FROM THE FOUNDATION

Lath and Plaster Detention and Security Walls

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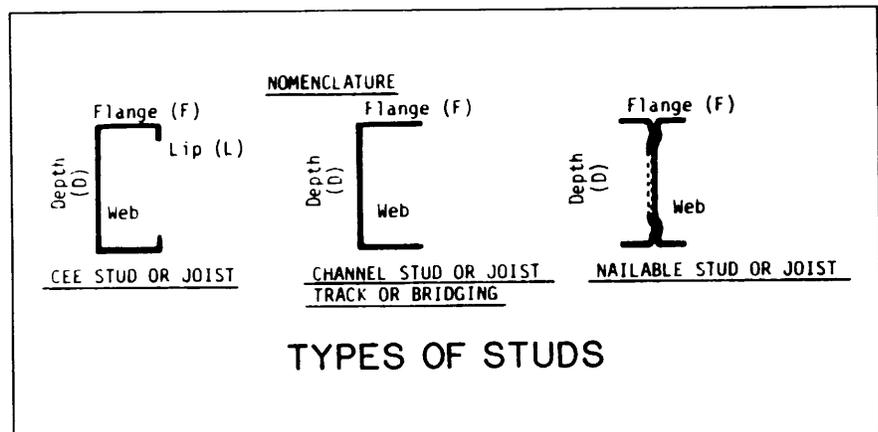
General

For more than half a century, lath and plaster has been used to construct walls, partitions and ceilings in all kinds of security facilities. These include jails, prisons, courtrooms, hospitals, sanitariums, banks and vaults. This article will illustrate some of the recent systems used. Specific information on individual products is readily available from various manufacturers and your local lath and plaster information bureau.

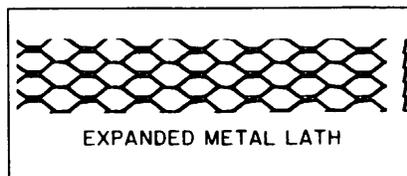
COMPONENTS

Studs, Channels and Rods

There are numerous steel sections which can be used to frame vertical and horizontal security elements. Steel studs are available in widths of 1-5/8" to 6" and in metal thickness of 25 gauge (0.0209") to 14 gauge (0.074"). Heavier gauge studs are preferred to facilitate welding and for producing stronger walls. Steel studs are available painted or fabricated from galvanized steel. Painted sections generally cost less and are more easily welded than galvanized steel. Sixteen gauge cold rolled channels are produced in 3/4", 1-1/2" and 2" widths. Hot rolled sections are available in 3/4", 1-1/2" and 2" as well. Solid plaster partitions



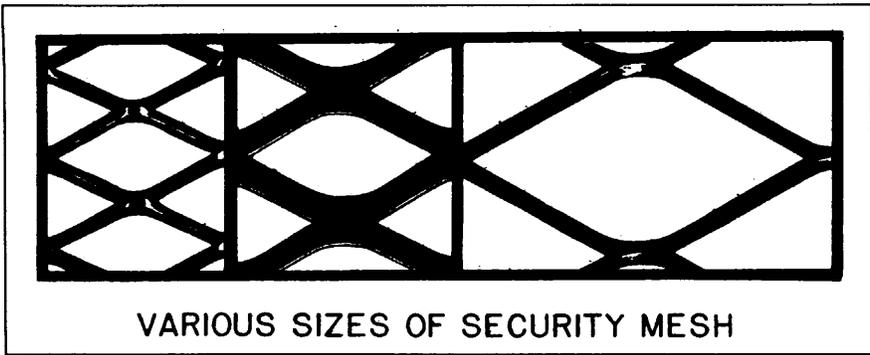
are sometimes framed with steel pencil rods or reinforcing bars, 3/8" to 3/4" in diameter. They can easily be wire tied or welded together to form a grid to which expanded metal security mesh and metal lath is attached.



METAL LATH

Expanded metal lath is available flat, self-furred and as rib lath. The

weight of expanded lath is measured in lbs. per sq. yard, such as 2.5, 2.75, 3.4 and 4.0. It can be fabricated from galvanized steel or coated with rust-resistant coating. Welded wire and woven wire laths are fabricated from galvanized wire into a grid or hexagonal pattern. The weight of wire lath can be 1.1 to 1.95 lbs. per square yard. Because of the unusually large openings in wire lath, this material is normally fabricated with a paper backing to aid plastering operations. Attachment of lath to steel framing is done with wire ties or self-tapping screws. Metallic laths are usually nailed or stapled to wood framing.



EXPANDED METAL SECURITY MESH

Expanded metal is a rigid, non-raveling piece of metal which has been slit and drawn in a single operation. The expanded metal is stronger and more rigid than the original sheet, before expanding. It is too heavy and rigid to be used as a plaster base but provides a formidable barrier in the core of a plastered partition. Expanded metal security mesh is available in a standard or flattened pattern; carbon steel (plain or galvanized), stainless steel or aluminum in metal thickness of .030" to .119". The size (length and width) of the diamond openings designates the style. Usually the term SWD (Short Way of Design or Short Way of Diamond) is used along with the thickness of the metal to designate a style of mesh. Every manufacturer has a different variety of styles but generally speaking, diamond designs are available in SWDs of 3/16", 1/4", 1/2", 5/8", 3/4", 1" and 1-1/2".

PLASTER

Plaster for security wall construction must not only be strong but must also be crack resistant and economical to apply. Mixes prepared from portland cement and some gypsum cements offer these qualities. Authorities agree that a minimum 1400 psi plaster is desirable for security purposes.

Following are some compressive strength figures for different plaster mixes:

PLASTER MIX	COMPRESSIVE STRENGTH PSI
1. Portland Cement, Lime and Sand (1:3/4:6)	1500
2. Portland Cement, Plastic Cement & Sand (1/2: 1/2:4)	1400
3. STRUCTOBASE Gypsum and Sand (1:2)	2800
STRUCTOBASE Gypsum and Sand (1:2-1/2)	1900
STRUCTOBASE Gypsum and Sand (1:3)	1400
4. Wood Fiber Gypsum without Aggregate (Neat)	1750
5. Wood Fiber Gypsum and Sand (1:1)	1400

Portland cement plaster is recommended in locations subject to frequent or severe wetting. It is, however more difficult to work and generally costs more than gypsum plasters. It is difficult to get crack free, smooth troweled finishes in portland cement plaster--so sand floated finishes are suggested.

Security Wall Specifications

PART 1: GENERAL

1.01 Description

- A. Steel Stud Framing, Lathing and Plastering.
- B. Special items of work.
 1. Steel studs.
 2. Security mesh.
 3. Metal lath and accessories.
 4. High strength plaster.

1.02 Related work specified elsewhere

- A. Concrete curbs and bases.
- B. Wood framing.
- C. Structural steel framing.

1.03 Requirements of regulatory agencies

- A. Comply with all applicable code and regulations.

1.04 Reference specifications and standards

- A. Product manufacturers' printed specifications.
- B. Metal Lath/Steel Framing Manufacturers Specifications for Metal Lathing and Furring.
- C. ANSI A42.3, Specification for Lathing and Furring for Portland Cement, Portland Cement-Lime Plastering, Exterior and Interior.
- D. ASTM C841 Standard Specification for Installation of Interior Lathing and Furring.
- E. ASTM C926, Standard Specification for Application of Portland Cement Based Plaster.
- F. ASTM C842, Standard Specification for Application of Interior Gypsum Plaster.

1.05 Submittals

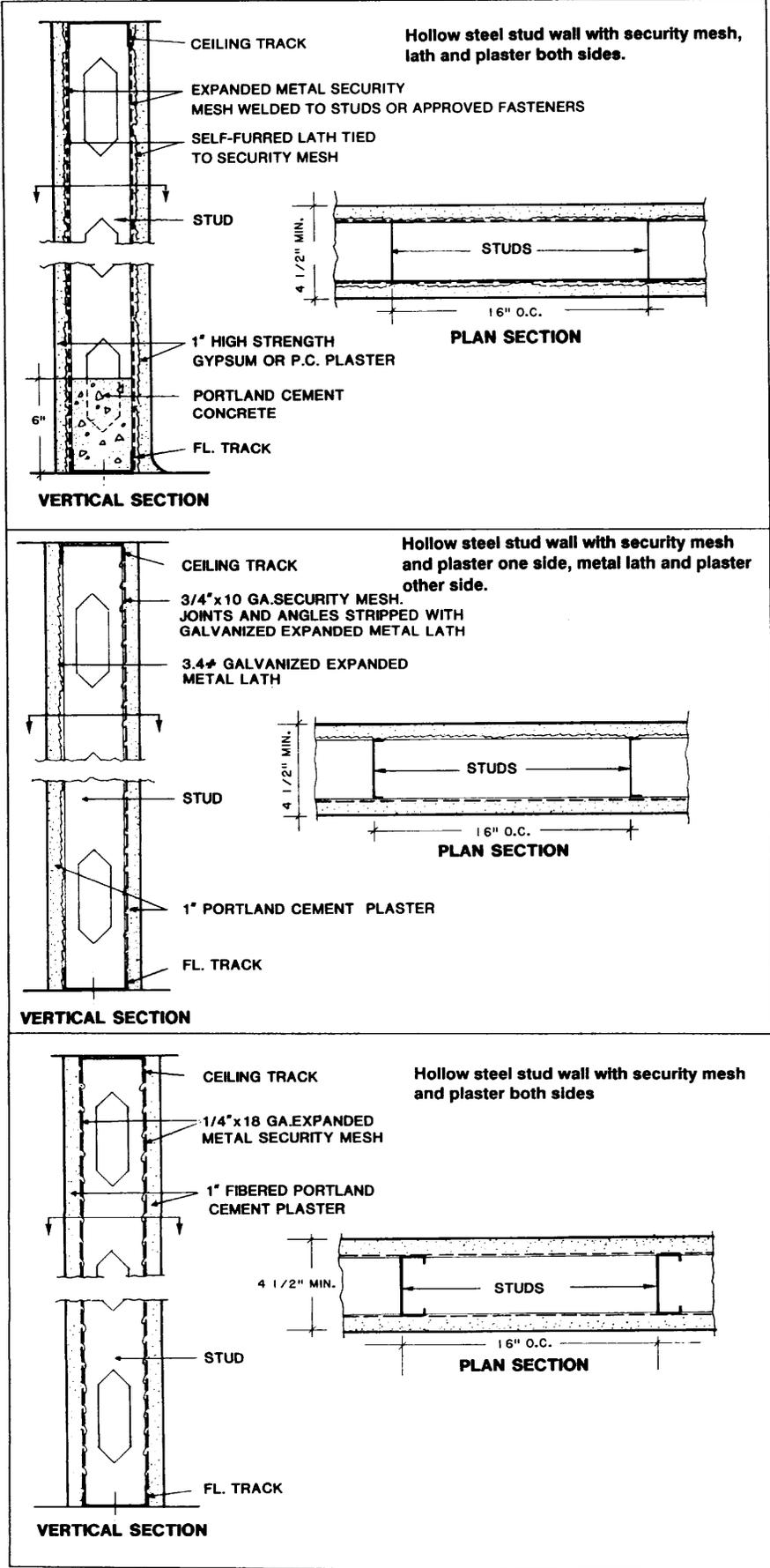
- A. Certification of conformance of materials with specification requirements.
- B. Submit shop drawings and supporting calculations as required.

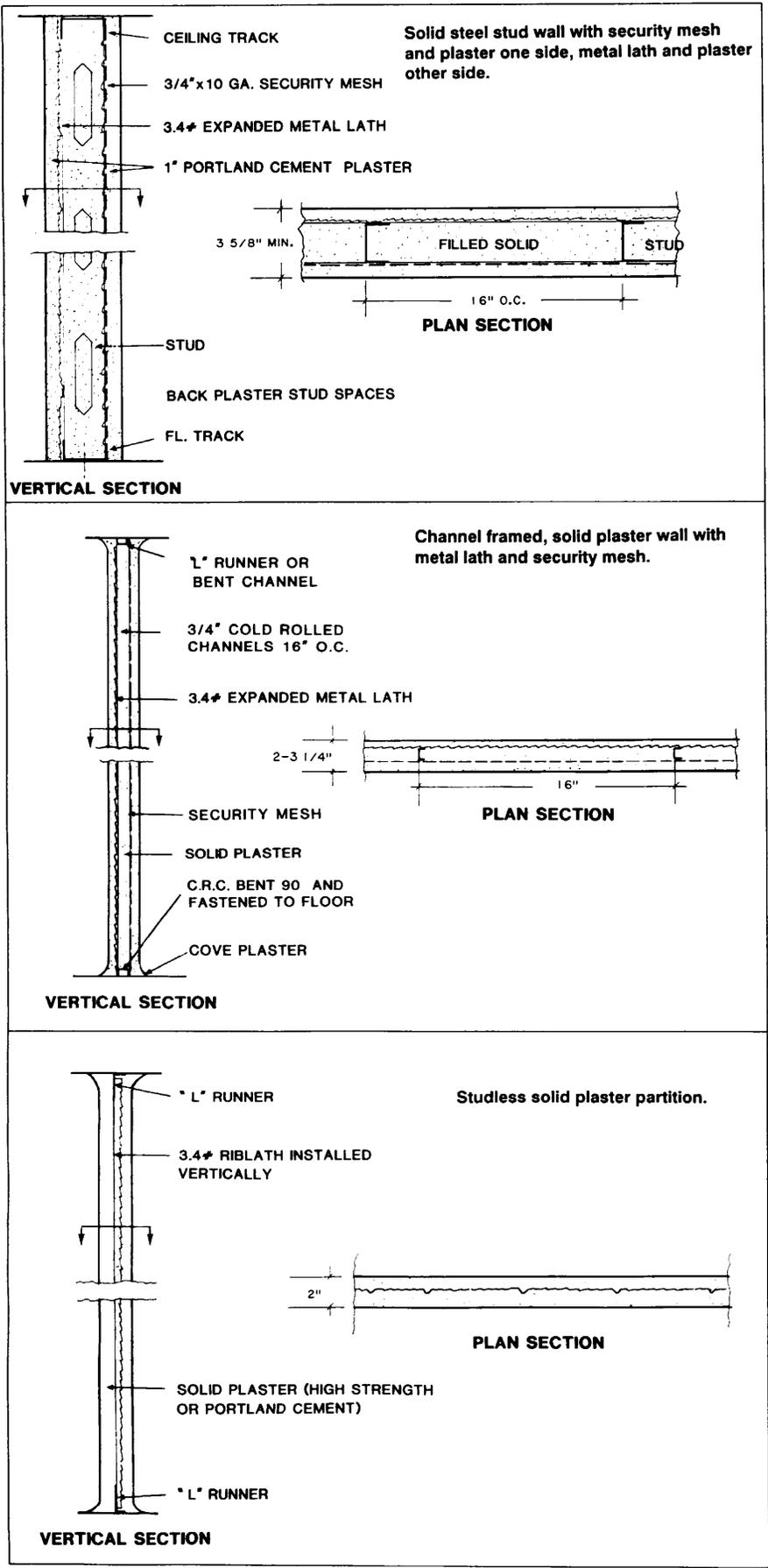
PART 2: PRODUCTS

2.01 Materials

2.01.01 Steel Studs & Joists

- A. All studs and/or joists and accessories shall be of the type, size, gauge and spacing as shown on the drawings.
- B. All studs and/or joists and accessories shall be coated with rust inhibitive paint, or be fabricated from galvanized steel, corresponding to the





requirements of ASTM A446, Grade A, with a minimum yield of 33 ksi.

2.01.02 Security Mesh

A. Expanded steel security mesh shall be slit and drawn into a diamond patterned mesh from carbon steel and roll flattened to provide a finish thickness of not less than .048 inches (16 gauge).

B. The short way of the diamond openings shall not be more than 3/4".

C. Material shall conform to Military Specification MIL-M-17194C Type II Class 1.

2.01.03 Lath

A. Expanded metal lath shall be made from copper alloy steel sheets and given a protective coat of rust inhibitive paint after fabrication, or shall be made from galvanized steel.

B. Lath shall be self-furring design and weigh not less than 3.4 lbs. per square yard.

2.01.04 Lath Accessories

A. Casing beads, fabricated from not less than 26 gauge steel or zinc alloy, shall be installed wherever plaster stops or abuts dissimilar materials.

B. Corner reinforcement for Portland Cement Plaster. Plaster at all external corners shall be reinforced with galvanized, expanded wing corner reinforcements. Internal corners shall be reinforced with cornerite not less than 4" wide (2" on each surface).

C. Cornerbeads--for gypsum plaster. Small nose or bull nose cornerbeads shall be fabricated from minimum 26 gauge galvanized steel.

2.01.05 Mechanical Fasteners

A. Self-drilling screws shall be panhead type long enough to penetrate through steel studs at least 1/4 inch.

B. Nails (for attaching metal lath to wood supports) shall be not less than No. 11 gauge barbed roofing nails which will provide at least 3/4" penetration into supports.

C. Galvanized wire for securing metal lath to steel studs and security mesh shall be at least one loop of 16 gauge wire or two loops of 18 gauge wire. Wire for attaching accessories to lath shall be 18 gauge and annealed.

2.01.06 Portland Cement Basecoat

Plaster Materials

A. Portland Cement, ASTM C150, Type I, II or III.

B. Plastic cement conforming to the requirements of ASTM C150, except in respect to the limitations on insoluble residue, air entrainment and additions subsequent to calcination.

C. Hydrated lime, ASTM C206, Type S.

D. Sand aggregate, ASTM C897. Where specification sand is not available, the best washed sand in terms of sieve analysis, cleanliness, freedom from fines, etc., may be used.

E. Alkali resistant natural or synthetic fibers, 1/4 to 1/2 inch in length shall be used in portland cement scratch and brown coats to improve crack resistance. Alkali resistant glass fiber shorts, or polypropylene fibers.

F. Water shall be clean, fresh and suitable for domestic consumption. It must be free of such amounts of mineral or organic substances which could affect the set, the plaster or any metal in the system.

2.01.07 Portland Cement Finish Coat Plaster Materials

A. Proprietary, portland cement based, acrylic modified finish coat plasters requiring only the addition of mixing liquid on the job.

B. Job mixed finish coats:

1. Portland cement--ASTM C-150, Type I, II, III, white cement where designated.

2. Hydrated lime, ASTM C-206, Type S.

3. Sand--ASTM C897. Exceptions to sand gradation for finish coats shall be stipulated where texture surfaces are specified and aggregate gradation has a significant role.

4. Acrylic admix--Approved emulsified product developed for use with water in preparing mixing liquid.

C. Water--potable and clean and free of such amounts of mineral or organic substances as would affect the set, the plaster or any metal in the system.

2.01.08 High Strength Gypsum Basecoat Plaster Materials

A. STRUCTO-BASE--Gypsum Plaster, complying with requirements of ASTM C-28 and Federal Specifica-

tion S-P-00402B, Type II.

B. Wood Fiber Gypsum Plaster, complying with the requirements of ASTM C-28 and Federal specification S-P-00402B, Type III.

C. Sand Aggregate, ASTM C-35, and shall be clean, sharp and free of materials which could adversely affect the plaster.

D. Water, potable and should not contain impurities that affect the setting of gypsum.

2.01.09 High Strength Gypsum Finish Coat Plaster Materials

A. STRUCTO-GAUGE, high strength gypsum gauging plaster, ASTM C-28, Federal specification SSOP-00402B, Type V with the added requirement of 5000 psi compressive strength.

B. Keenes Cement, dead burned gypsum gauging, complying with ASTM C-61 and Federal Specification SS-P-00410, Type I or II.

C. Finish lime, ASTM C-206, Type S.

D. Sand, ASTM C-35, for float finishes shall be clean, washed, graded

white silica sand passing a (30 mesh) (20 mesh) screen.

E. Water--potable, and not containing impurities that affect the setting of gypsum.

PART 3: EXECUTION

3.01 Preliminary Inspection

3.02 Environmental Conditions

A. Do not apply plaster to any base containing frost. Plaster mixes shall not contain frozen ingredients. Plastering operations must not take place when temperatures are below 40 degrees F and must be protected from freezing for a period of not less than 48 hours after set has occurred.

B. Protect plaster from uneven and excessive evaporation during dry weather and hot dry winds.

3.03 Steel Stud Framing

3.03.01 Runner tracks shall be securely anchored to the supporting structure as shown on drawings.

A. Anchor floor track to concrete with washers and nuts fastened to 1/2" diameter bolts set in concrete not

over 24" o.c. or power driven fasteners or expansion drivers providing equal holding power.

B. Attach track to steel with wire ties, bolts, screws or welds not over 24" o.c.

C. Abutting sections of runner track shall be securely anchored to a common structural element or be butt welded or spliced together.

3.30.02 Attach studs to track by welding or screwing.

A. Studs shall be cut to proper length and installed plumb, without bows and evenly spaced.

B. Provision for structure vertical movement shall be provided as indicated on the drawings.

C. Install 1-1/2" cold rolled channel stiffeners not over 4'-6" apart. For partitions having unsupported height: from 8' to 18', place stiffeners on alternate interior sides; over 18', place on each interior side. Wire tie stiffeners to each stud.

3.30.03 Expanded steel security mesh shall be fillet welded to steel studs not over 8" o.c. or equivalent approved fasteners. Edge welds must be within 2" of edge.

A. End joints shall be butted and occur over a stud. Edge joints shall be butted and wire tied at mid point

between supports.

3.30.04 Lath Installation

A. Attach expanded metal lath to security mesh with wire ties not over 6" o.c. vertically and 16" o.c. horizontally.

B. Stagger end laps. Return lath 4 around comers or use comerite. Carry lath over concrete foundations at least 2".

C. Direct attachment to steelstuds shall be made with wire ties or screws not over 6" o.c.

D. Attach lath to wood supports at furring points and not over 6" o.c.

3.03.05 Lath Accessories

A. Install casing beads, control joints, comer reinforcement and other metal plaster accessories to plaster line (using shims if necessary). Attach accessories by wire-tying, nailing or stapling through wings or holes provided. Attachment shall be strong enough to hold accessory in place during plastering operations.

3.06 Basecoat Plaster

3.06.01 Proportions

A Portland cement (common), lime and sand or common portland cement and plastic portland cement. In proportions set forth in ASTM specification C-926 with added requirement that 1 lb. of alkali resistant fi-

bers be added per sack of cement.

B. STRUCTO BASE high strength gypsum, sanded 1:2 for scratch and 1:3 for brown

C. Wood Fiber plaster neat or sanded up to 1:1 for scratch and 1:1 for brown

3.06.02 Application -- shall be done in accordance with ASTM C-926 or ASTM C-842, whichever is applicable.

3.07 Finish Coat Plasters

3.07.01 Proportions

A. Finish coat plasters for portland cement basecoats shall be proprietary acrylic modified portland cement based or job mixed finish coat plaster as described in ASTM C-926.

B. Finish coat plaster for STRUCTO-BASE high strength gypsum basecoat shall be prepared from STRUCTO-GAUGE gauging plaster and lime proportioned by dry weight 1:1.

C. Finish coat for wood fiber basecoat plasters shall be STRUCTO-GAUGE and lime proportioned by dry weight 1:2 or Keenes cement and lime proportioned by dry weight 4:1.

3.07.02 Application -- shall be done in strict accordance with ASTM C-926 or ASTM C-842, whichever is most applicable.

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