PLAINTIFF'S EXHIBIT

USG-1700

A.I.A. File 21-A 39-B

TECHNICAL INFORMATION

# USG* GYPSUM PLASTERS —

## BASECOAT PLASTERS
## FINISHING LIMES
## ACOUSTICAL PLASTERS
## FIREPROOFING PLASTERS

BB009 1319

A.I.A. File 21-A 39-B

UNITED STATES GYPSUM

1964

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UNITED STATES GYPSUM

# BASECOAT PLASTERS

The most expedient way to obtain any additional information regarding (fire, sound, etc.) test data in this publication is to direct inquiries to:
**UNITED STATES GYPSUM**

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## NOTE TO THE ARCHITECT

In the preparation of plastering specification consideration should be given to the selection of materials for compatibility and the quality of the structure to be plastered. ASA Specifications and the specifications within the AIA File are based on Minimum Standards. Unfortunately, most plastering specifications are written on a minimum basis, despite the fact that all the elements are available to upgrade plastering for quality installations. It is not possible to be specific without knowing the project under design, the type base, etc., however, it is possible to generalize. The following recommendations are listed in the order of preference:

**Basecoat Plaster (over metal lath)**

| Scratch Coat | Brown Coat |
|---|---|
| 1. STRUCTO-BASE ① Cement Plaster, Sanded 1:2 | STRUCTO-BASE Cement Plaster, sanded 1:3 |
| 2. Wood Fiber, neat, or sanded up to 1:1 | Wood Fiber, sanded up to 1:1 |
| 3. Wood Fiber, neat, or sanded up to 1:1 | RED TOP* Cement Plaster, sanded 1:1 |
| 4. Wood Fiber, neat | STRUCTO-LITE* |
| 5. RED TOP Cement Plaster sanded 1:2 | RED TOP Cement Plaster, sanded 1:3 |
| 6. STRUCTO-LITE | STRUCTO-LITE |
| 7. RED TOP Cement Plaster, perlited 1:2 | RED TOP Cement Plaster perlited 1:2 |

① Verify availability with your local U.S.G. Sales representative.

**Aggregates**

1. Sand
2. Mill Mixed Perlite
3. Job Mixed Perlite
4. Job Mixed Vermiculite

**NOTE:** Lightweight aggregates must *never* be used on a construction where sound isolation is a consideration.

**Finish Coats**

**Float Finishes**

1. ORIENTAL Interior
2. IVORY Lime (92% hydrate) Keenes Cement and White Silica Sand

**Smooth Trowel Finishes**

1. IVORY Lime, and STRUCTO-GAUGE
2. IVORY Lime, and Keenes Cement
3. IVORY Lime, RED TOP Gauging, with ½ cu. ft. of Perlite fines or fine silica sand.

**NOTE:** Float Finishes 1, 2 and Trowel Finish 3 are the only finishes recommended for use over a perlited basecoat. Finishes 1 and 2 (smooth trowel) provide high abrasion resistance and because of their hardness must be used over a comparably hard basecoat.

**Application**

Three-coat work is mandatory on all metal lath and edge supported gypsum lath on ceiling construction.

Three-coat work is desirable on all gypsum lath.

Two-coat work is acceptable on unperforated gypsum lath and masonry plaster bases.

The UNITED STATES GYPSUM COMPANY maintains a qualified staff of Technical Consultants, Architect Service Representatives, conveniently located in most major markets to assist in resolving specific problems.

## BASECOAT PLASTERS

### DESCRIPTION

The base of all gypsum plasters is gypsum rock, hydrous calcium sulfate, which has a water content of about 20% in chemical combination. In its manufacture, chemically combined water is removed from the gypsum rock by means of a controlled calcination procedure. Then as water is added at the job, the material crystallizes (sets), reverting to its original chemical composition.

RED TOP Gypsum Plasters are specifically formulated to control setting time and other important characteristics. This depends upon the intended method of application, the climatic conditions of the area in which they will be used, and their intended use.

USG Basecoat Plasters can be applied by using either hand or machine methods, on gypsum or metal lath; gypsum, clay, or concrete tile; concrete or cinder blocks; brick, or other approved plaster bases.

### FUNCTION & UTILITY

Basecoat plasters provide a plastic working material which will conform to most designs and provide the ultimate in durable walls and ceilings.

**Fire-Protection**—Gypsum plaster, properly proportioned with approved aggregates, and used in conjunction with specific plaster bases, provides excellent fire-protection.
(See pages 12 & 13 of AIA File 20 for "Fire Test Data")

**Strength**—There are significant differences in the strengths of gypsum basecoat plasters. The strength of a gypsum basecoat plaster is dependent on four factors:

1. *Water-Cement Ratio*—The water required to produce a plastic mix depends on the amount and type of aggregate. (See technical data page 3)
2. *Control of Set*—RED TOP Gypsum Plasters are formulated for use with market aggregates, climatic conditions, and job conditions. The quicker a gypsum plaster sets, the stronger the basecoat.
3. *Time of Application*—Plasters should be applied within one hour after mixing to assure desired strength and proper bond.
4. *Ventilation and Drying* are important adjuncts to producing a strong basecoat once the gypsum plaster has set. Not only must the plaster be dried, but the water must be removed from the building.

**Sound Isolation**—Gypsum plaster in combination with lathing or construction systems offers sound transmission loss characteristics suitable for most requirements. Sanded basecoat plasters provide the optimum results.

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• Since methods and conditions of application and use are beyond our control, the United States Gypsum Company will not be responsible for failure of its products when not used according to directions and specifications.

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## LIMITATIONS OF USE

1. STRUCTO-BASE, or RED TOP Cement Plaster must have aggregate added strictly according to specifications. Use of too much aggregate drastically decreases its strength.
2. Machine application of wood fiber plaster requires the addition of up to 1 cu. ft. of sand per 100 lbs. of plaster.
3. Where sound transmission is the prime consideration in partition or ceiling assemblies, use sand aggregate only, since mass is a controlling factor.
4. BONDCRETE should be used on interior concrete surfaces providing the surface is sufficiently rough to provide a proper bond. Maximum thickness of BONDCRETE shall not exceed ⅛" on ceilings or ⅝" on walls. If additional thickness is required, self-furring metal lath should be secured to the concrete surfaces. Under no circumstances should STRUCTO-BASE or RED TOP Cement Plaster or Wood Fiber Plaster be applied directly to monolithic concrete.
5. Gypsum plasters should not be used where they will come in contact with water or excessive moisture. In such instances use Portland cement-lime plaster.

   Gypsum plasters may be applied to ceilings of open porches, car-ports, soffits of eaves, walkways, and canopies, but only when these surfaces are horizontal or inclined downward from the structure. All such plaster surfaces should be protected from direct exposure to rain and suitable drips and casings provided along edge exposure. Refer to Gypsum Association, AIA File 21-A-2, Gypsum Plaster in Exterior Locations.
6. Plaster application on masonry or concrete walls, or ceilings that have been coated with bituminous compounds or other waterproofing agents is not recommended.

   Because of the possibility of condensation or water seepage, plastering to interior side of exterior masonry walls above grade or exterior foundation walls below grade is not recommended. In each instance they shall be furred and lathed before plastering. Sub-grade construction should also be water-proofed on the exterior side.
7. Radiant heat plaster slabs shall not have surface temperatures exceeding 115° Fahrenheit. Check conductivity of the plaster and aggregate. The thermal conductivity of gypsum-sand plaster is approximately three times that of STRUCTO-LITE. Refer to Gypsum Association, AIA File 21-A-2, Gypsum Plaster with Radiant Heating.
8. Basecoat plasters must not abut or stop against a hollow metal door frame return unless provision is made to dampen the trim return vibration by grouting, and the use of special anchors. Lath and plaster should recess into or behind metal frames or base.
9. On remodeling work where a new plaster surface is to be applied over an existing wall or ceiling, the use of self-furring metal lath, with scratch and brown coats of neat wood fiber plaster, will give superior results. The use of gypsum plasters containing light weight aggregates is not recommended for this purpose.

## USE OF AGGREGATES With Gypsum Cement Plasters—maximum recommended proportions

| Plastering Base | Number of Coats | Type of Coats | Maximum quantity of aggregate, in cu. ft. to be used with 100 lbs. of neat gypsum plaster | | | |
|---|---|---|---|---|---|---|
| | | | UNDER SMOOTH TROWEL FINISHES | | UNDER OTHER FINISHES | |
| | | | Sand (1) | Perlite or Vermiculite | Sand (1) | Perlite or Vermiculite |
| GYPSUM LATH | 3 | Scratch<br>Brown | 2<br>3 | 2<br>2 | 2<br>3 | 2<br>3 |
| | 2 | Basecoat | 2½ | 2 | 2½ | 2½ |
| METAL LATH | 3 | Scratch<br>Brown | 2<br>3 | 2 (See 2 Note) | 2<br>3 | 2<br>3 |
| UNIT MASONRY | 3 | Scratch<br>Brown | 3<br>3 | 3<br>3 | 3<br>3 | 3<br>3 |
| | 2 | Basecoat | 3 | 3 | 3 | 3 |

NOTE: Under a smooth trowel finish, in a construction system which has metal lath as the plaster base, vermiculite aggregate is not recommended for use in the basecoat plaster.

(1) Approximately six No. 2 shovels of sand equal 1 cu. ft.

## TECHNICAL DATA—Basecoat Plasters

| PLASTER | | MIX | COMPRESSIVE STRENGTH | WEIGHT | CONDUCTIVITY |
|---|---|---|---|---|---|
| | | | psi—dry (1) | lb./cu. ft.—dry | (K) |
| STRUCTO-LITE | (Regular) | | 900 | 50 | 1.74 |
| WOOD FIBER | | Neat | 2000 | 82 | 3.15 |
| WOOD FIBER | (Sand) | 100:1 | 1700 (2) | 97 | |
| STRUCTO-BASE | (Sand) | 100:2 | 3750 | 124 | |
| | | 100:3 | 2500 | 121 | |
| RED TOP CEMENT PLASTER MIXED WITH— | Sand | 100:1<br>100:2<br>100:3 | 1800<br>1065<br>650 | 100<br>107<br>109 | <br>5.51<br>5.60 |
| | Perlite | 100:2<br>100:3 | 900<br>550 | 48<br>41 | 1.64<br>1.31 |
| | Vermiculite | 100.2<br>100.3 | 485<br>290 | 48<br>41 | 1.74<br>1.42 |

(1) Average Laboratory Test Results. Figures may vary slightly for products from individual mills. Tested in accordance with ASTM C26.

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# BASECOAT PLASTERS

## RED TOP Wood Fiber Plaster

Complies with ASTM Spec. C-28 and Federal Specification No. SS-P-402 Type W.

RED TOP Wood Fiber Plaster is a gypsum plaster containing fine particles of selected wood fiber. It normally requires the addition of water only; however, when used over masonry plaster bases, 1 cu. ft. of sand per 100 lbs. of plaster must be added and when used as a brown coat 1 cu. ft. of sand may be added. Wood fiber plaster can be applied to all standard lath and masonry plaster bases.

Wood fiber plaster is strongly recommended as a scratch coat for metal lath.

**Weight**—Wood fiber weighs approximately one-quarter less than a sanded gypsum basecoat.

**Strength**—Wood fiber has twice the compressive and tensile strength of sanded plaster.

**Fire-Resistance**—Wood fiber is an excellent fireproofing material, generally provides 50% higher ratings than sanded gypsum plaster.

**Cost**—Wood fiber plaster costs slightly more than sanded gypsum plaster. (Neat) Cost Index—122

## RED TOP Cement Plaster

Complies with ASTM C-28 and Federal Specification No. SS-P-402 Type N.

RED TOP Cement Plaster is a gypsum basecoat requiring the addition of aggregate. It is supplied as either Fibered or Unfibered and is formulated for use over all accepted plaster bases. Formulation includes:

**Regular**—for use with sand aggregate, hand application.

LW—for use with lightweight aggregate, hand application.

**Machine Application**—for use with sand or lightweight aggregate.

**Quality**—Gypsum cement plaster is set stabilized and formulated for market conditions and seasonal changes.

**Strength**—RED TOP Cement Plaster properly proportioned with aggregate forms a hard durable base for application of finish coats. Compressive strengths based on the type aggregate and proportioning are shown in the Technical Data Table, page 3.

**Fire-Resistance**—The fire-rating of specific assemblies, based on the type aggregate and proportioning, is shown in the Fire Ratings, AIA File 20, pages 12 & 13.

**Cost**—The Gypsum cement plaster mixed with a low cost aggregate increases its bulk and coverage. Highly plastic, it is easily and quickly applied. Cost Index—100

## STRUCTO-BASE Cement Plaster

Complies with Federal Specifications SS-P-402, Type N, and ASTM Designation C-28 for "gypsum neat plaster" including the added requirement of 3,500 lbs. per square inch compressive strength when mixed with two parts by weight of Standard Ottawa Sand.

STRUCTO-BASE is a special gypsum basecoat plaster that develops higher strengths than conventional plasters. It is recommended for basecoat plaster in such areas as handball courts, hospital corridors, schools, etc., or wherever a high strength basecoat plaster is necessary. (Consult your local U.S.G. Sales representative for availability in your area.)

Cost Index—110

## RED TOP STRUCTO-LITE Plaster

Complies with ASTM C-28 for gypsum ready mixed plaster.

RED TOP STRUCTO-LITE is a mill mixed gypsum cement plaster and perlite aggregate which requires the addition of water only at the job site. It is formulated in four types:

**Regular**—for use over gypsum lath, hand application.

**Masonry**—for use on high suction unit masonry base only, hand application.

**Regular**—for use over gypsum lath, machine application.

**Masonry for Machine Application** on high suction masonry unit.

**Quality**—RED TOP STRUCTO-LITE is formulated to assure the architect of a unit responsibility. Mill mixed lightweight aggregated plaster provides:

1. Control of set (see RED TOP Cement Plaster, LW formulation).
2. Proper proportioning of aggregate (see page 3, two cubic feet of lightweight aggregate is recommended for both scratch and brown).
3. A quality of perlite with proper gradation and hardness necessary for a basecoat plaster.

**Weight**—STRUCTO-LITE weighs less than half as much as sanded basecoat plaster.

**Insulation**—STRUCTO-LITE has a "k" factor of 1.55, providing 3½ times the insulation of sanded plaster. For this reason STRUCTO-LITE is not recommended for use with radiant heated panels.

**Fire-Resistance**—The added fire-protection afforded by STRUCTO-LITE is the outstanding contribution of the product.

**Cost**—Over-all cost is comparable to job-mixed lightweight aggregate plaster. Cost Index—106

## RED TOP BONDCRETE Plaster

Complies with ASTM C-28 for gypsum bond plaster.

RED TOP BONDCRETE is a specially formulated bonding basecoat plaster for use over properly roughened interior concrete surfaces. Water only is added.

**Bond**—BONDCRETE adheres to properly prepared concrete surfaces (see Specifications, Section V, paragraph "a"). BONDCRETE has approximately the same coefficient of expansion as concrete.

**Cost**—Since both labor and material costs are virtually the same as wood fiber plaster, it is an economical and practical basecoat for concrete surfaces.

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BASECOAT PLASTERS—Cont'd

# FINISH COAT PLASTERS

## PORTLAND CEMENT PLASTER

Portland Cement Basecoat Plasters are required for interior use where high moisture conditions exist or as an exterior basecoat for stucco. A Portland Cement Lime Plaster is prepared on the job in the following proportions:

**Scratch Coat**—1 sack of Portland Cement
2 sacks of MORTASEAL* Lime
7½ cu. ft. of sand
2 lbs. of fiber (over metal lath or stucco mesh)

**Brown Coat**—1 sack of Portland Cement
2 sacks of MORTASEAL* Lime
9 cu. ft. of sand

**Finish Coat**—USG's ORIENTAL Exterior Stucco (Mill mixed), a white, or colored float or texture finish plaster.

### LIMITATIONS OF USE

1. Scratch and brown coat requires curing with water after set.
2. Must not be applied directly to smooth, dense surfaces, gypsum lath or gypsum block. Self-furring metal lath must be secured to such surfaces before plaster is applied.
3. Control joints should be provided to compensate for the shrinkage of the Portland cement mortar during drying.
4. A Keenes cement-lime putty finish must never be used over a Portland cement basecoat.

## FINISH COAT PLASTERS

### DESCRIPTION

There are several types of gypsum finish plasters, some are used with the addition of water only, while others are a blend of gypsum, lime and water, or gypsum, lime, sand and water.

Since the finish coat must be compatible with the basecoat care must be taken in the selection of the finish coat materials in relationship with the characteristics of the basecoat.

There are three general classifications of finishing materials:

1. Prepared finishes
2. Smooth trowel finishes
3. Sand float finishes

### FUNCTION & UTILITY

The finish coat serves as a leveling coat, as a base for decoration and provides the required resistance to abrasion.

Gauging plasters impart an early hardness and strength, minimizing the shrinkage characteristic of lime.

### LIMITATIONS OF USE

1. Where *vermiculite* is used as the aggregate in a gypsum basecoat, or the proportion of perlite exceeds 1:2, a Sand Float Finish or an Acoustical Plaster must be used.
2. Where perlite is used as the aggregate in a gypsum basecoat (recommended proportioning 1:2), or when the basecoat is STRUCTO-LITE, the finish coat must be an Acoustical Plaster, a sand float finish, or a trowel finish of RED TOP Gauging Plaster and lime, with addition of ½ cu. ft. of perlite fines or 50 lbs. of No. 1 white silica sand per 100 lbs. gauging plaster.
3. Gypsum base finishes including Keenes cement should not be used over a Portland Cement Basecoat.
4. Gauging plasters providing extremely hard surface abrasion, STRUCTO-GAUGE and Keenes cement, must not be used over STRUCTO-LITE, or a basecoat with a lightweight aggregate.

## FINISH COAT MATERIALS

A chart for the selection of finish coat materials is provided on page 6. The following materials are included:

**ORIENTAL* Interior Stucco**—A white finish plaster for a sand float or textured finish. May also be ordered formulated for machine application. Provides excellent hardness and a very durable finish.

**Gauging Plasters**—For blending with lime putty.

**STRUCTO-GAUGE**—A high strength gypsum gauging plaster, which provides the greatest hardness and resistance to surface abrasion. Complies with ASTM C-28 and Federal Specification SS-P-402, with the added requirement of 5000 psi.

**RED TOP Keenes Cement**—A dead burned gypsum gauging, which requires extensive troweling. This troweling densifies the surface for hardness and resistance to surface abrasion. Complies with ASTM C-61 and Federal Specification SS-C-161 Type I (Regular) II (Quick Troweling).

**CHAMPION* and STAR* WHITE Gauging Plaster**—These conventional quick and slow set gauging plasters, comply with ASTM C-28 and Federal Specification SS-P-402, Type G.

**RED TOP Gauging**—Similar to CHAMPION and STAR Gauging except it comes in a slightly darker color. Complies with ASTM C-28 and Federal Specification SS-P-402, Type G.

### FINISHING LIMES

**IVORY* Double Hydrated Finishing Lime**—A 92% hydrated finishing lime. Does not require soaking, and eliminates the possibility of future expansion within the finish coat because of unhydrated magnesium oxides. Complies with ASTM C-206, Type S, and Federal Specification SS-L-351, Type F. (Not more than 8% unhydrated oxides).

**RED TOP* and GRAND PRIZE* Normal Hydrate Finishing Lime**—Hydrate lime which requires soaking at least sixteen hours to develop proper plasticity and the degree of hydration necessary prior to use. Complies with ASTM C6, Type N, and Federal Specification SS-L-351, Type F.

**RED TOP Finish Quicklime**—High calcium finishing lime which requires 16 hours of soaking to develop a proper plasticity and the required degree of hydration prior to use. Complies with ASTM C5 and Federal Specification SS-Q-351.

### THIN COAT PLASTER

**TUFCON**(1) is an especially prepared spray finish of high strength gypsum for a 1/16 inch finish coat to be applied over a TUFCON(1) Base. No basecoat is required. the TUFCON Plaster finish provides an extremely hard surface with outstanding abrasion resistance.

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(1)T.M. of Plastering Development Center, Inc.

# FINISH COAT PLASTERS

## APPLICATION DATA

| DESCRIPTION | FINISH TEXTURE | PHYSICAL PROPERTIES | PROPORTION BY DRY WEIGHT—GAUGING TO LIME | WORKABILITY FACTOR | COMMENTS | COST INDEX |
|---|---|---|---|---|---|---|
| ORIENTAL* Interior Stucco | White Float or Texture Finish | Hard and Resistant to Abrasion | Neat | 1 | Available in white. Mill control of aggregate, size and proportioning. | 160 |
| STRUCTO-GAUGE* and Lime Putty | White Trowel Smooth | Extremely Hard and Resistant to Abrasion | 1:1 | 2 | Use for handball courts and psychopathic wards over a wood fiber or STRUCTO-BASE basecoat. | 150 |
| STRUCTO-GAUGE and Lime Putty | White Trowel Smooth | Hard and Resistant to Abrasion | 1:2 | 1 | Use for hospitals and schools over a wood fiber or sanded gypsum basecoat. | 125 |
| Keenes Cement and Lime Putty | White Trowel Smooth | Hard and Resistant to Abrasion | 4:1 | 7 | Use for handball courts and psychopathic wards over a wood fiber basecoat. | 180 |
| Keenes Cement and Lime Putty | White Trowel Smooth | Medium Hard & Resistant to Abrasion | 2:1 | 4 | Use for hospitals and schools over a wood fiber or sanded gypsum basecoat. | 170 |
| Gypsum Gauged Lime Putty | White Trowel Smooth | Standard | 1:2 | 1 | For normal use, over a perlite basecoat add ½ cu. ft. of perlite fines or 50 lbs. of #1 silica sand per 100# gauging. | 100 |
| Keenes Cement Lime Putty and Sand | White Float Finish | Hard | 50 lbs. Keenes<br>100 lbs. Lime<br>400 lbs. Sand | 1 | Commonly used float finish, may be satisfactorily colored. | 125 |
| Gypsum Gauging Lime Putty and Sand | | Standard | 50 lbs. Gauging<br>100 lbs. Lime<br>400 lbs. Sand | 1 | For normal use over any basecoat. | 100 |
| ORIENTAL* Exterior Stucco | Colored Float or Texture Finish | Extremely Hard and Resistant to Abrasion | Neat | 3 | For use over a Portland cement lime basecoat. Available in white and 6 colors. | 150 |
| TUFCON(1) Finish | Spray Texture or Trowel Smooth | Extremely Hard and Resistant to Abrasion | Neat | 1 | For use over an especially prepared TUFCON Base. No basecoat required. | |

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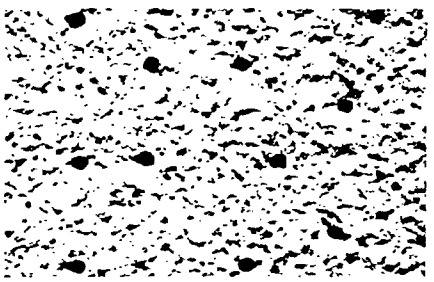
(1)T.M. of Plastering Development Center, Inc.

# USG ACOUSTICAL PLASTERS

The UNITED STATES GYPSUM COMPANY manufactures two types of sound absorbing, decorative finish acoustical plasters. They are architecturally adaptable to intricate ceiling designs, and can be used equally effective on curved or flat surfaces.

While these plasters perform the common function of absorbing sound and providing a decorative finish, each has certain characteristics which influence their individual selection.

## HI-LITE* Acoustical Plaster



**HI-LITE Stipple-Perforated**

### DESCRIPTION

HI-LITE Acoustical Plaster is a pure white acoustical material, with excellent light reflective characteristics, making it particularly adaptable for use in schools and office buildings where light reflectance and efficiency of illumination are important considerations. Its relatively high moisture resistance makes it an excellent choice for acoustical treatment in natatoriums and other areas in which high humidities are anticipated. HI-LITE Acoustical Plaster is not subject to the migration of rust stains from the construction over which it is applied.

It develops a harder finished surface than many acoustical materials, and can be cleaned or painted without reducing the absorption characteristics.

It may be applied over properly prepared gypsum plaster or Portland cement-lime plaster basecoats. It may be machine applied; however, the published sound absorption data does not apply in this case.

### FUNCTION AND UTILITY

**Sound Absorption**—Noise Reduction Coefficient of .60 when stippled or stipple-perforated. When stippled, HI-LITE exhibits outstanding sound absorption characteristics at the lower frequencies.

**High Light Reflectance**—Light reflectance of 80% for the normal stippled finish.

**Maintenance**—HI-LITE Acoustical Plaster may be cleaned with low pressure vacuum cleaner using a soft brush attachment.

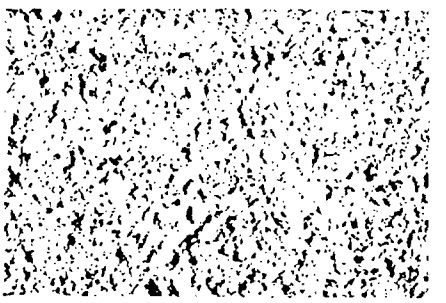
**Paintable**—May be redecorated with up to four coats of spray applied TEXOLITE Standard Paint without reducing sound absorption characteristics.

### LIMITATIONS OF USE

1. HI-LITE must be machine mixed in strict accordance with directions to develop proper density and working qualities.
2. HI-LITE may be machine applied, but published sound absorption coefficients do not apply unless hand applied and finished in accordance with specifications.
3. More durable than most acoustical materials, but is designed for use on ceilings or wall areas not subject to contact.
4. When perforated, a special perforator with rust resistant prongs should be used.
5. HI-LITE is not recommended for use over radiant heating installations.
6. HI-LITE is not recommended for direct application to monolithic concrete surfaces.

## AUDICOTE* Acoustical Plaster

**AUDICOTE Machine-Textured Finish**



### DESCRIPTION

AUDICOTE Acoustical Plaster is a low cost acoustical material designed for either modern efficient machine application or conventional hand application methods over a wide range of surfaces. It can be applied over properly prepared gypsum or Portland cement basecoats, monolithic concrete, prefabricated concrete units.

The uniform texture resulting from spray application makes AUDICOTE particularly suitable for use on large continuous ceiling areas. Through modifications of machine procedures and spray techniques, many pleasing textures are possible.

AUDICOTE is readily adaptable to tinting, and incorporation of special aggregates to further increase the design and decorative possibilities. Few other acoustical products present the designer with the flexibility and adaptability of AUDICOTE Acoustical Plaster.

### FUNCTION AND UTILITY

**Sound Absorption**—Noise Reduction Coefficient of .55.

**Light Reflectance**—When machine textured, has light reflectance of 65% for Satin White, and 70% for Special White.

**Maintenance**—May be economically refinished with a spray coat of AUDICOTE.

**Paintable**—May be redecorated with up to two coats of spray applied TEXOLITE* Standard Paint with no loss in Noise Reduction Coefficient. Up to four coats result in only a minor reduction in sound absorption characteristics.

**Colors**—Available in Satin White and Special White.

AUDICOTE may also be tinted on the job.

### LIMITATIONS OF USE

1. AUDICOTE is designed for use on ceiling and wall areas not subject to contact, excessive vibration or high moisture.
2. SPECIFIED precautions must be taken under certain circumstances to prevent the migration of water-borne stains to the surface of AUDICOTE. (See Specifications on Page 10.)
3. AUDICOTE is not recommended for use over radiant heating installations.

88009 1325

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# ACOUSTICAL PLASTERS

## TECHNICAL DATA

| ACOUSTICAL PLASTER | FINISH | LIGHT REFLECTANCE PER CENT (1) | HEAT INSULATION "K" FACTOR (2) |
|---|---|---|---|
| HI-LITE | Stippled | .80 | .50 |
| | Stipple-Perforated | .77 | |
| AUDICOTE | Machine Textured | Satin White .65 | .50 |
| | | Special White .70 | |

## LABORATORY TEST DATA

The absorptions reported below are the test results of representative panels. It is not always possible to achieve these results in the field. Care must be taken to mix the material to specified consistencies and applied to uniformly full grounds.

1. Light reflectance from tests at an independent recognized laboratory.
2. Heat insulation data from tests at USG Research Laboratory.
3. Sound absorption from standard tests at a recognized laboratory.

## SOUND ABSORPTION (3)

| ACOUSTICAL PLASTER | FINISH | FREQUENCY | | | | | | NRC |
|---|---|---|---|---|---|---|---|---|
| | | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| HI-LITE | Stippled | .41 | .26 | .59 | .78 | .84 | .65 | .60 |
| | Stipple-Perforated | .20 | .24 | .50 | .76 | .83 | .76 | .60 |
| AUDICOTE | Machine Texture | .26 | .28 | .53 | .67 | .73 | .66 | .55 |

# RED TOP* FIRECODE PLASTER

### DESCRIPTION

RED TOP FIRECODE Plaster is a ready-to-use gypsum plaster for spraying directly to steel floor units, beams and columns, to provide fire protection. It is lightweight, requires no lathing, bonding, agents, or hand tool operations, and does not shrink on drying. It can also be applied over metal lath to provide a fire resistive enclosure around structural members in which piping, ductwork or electrical conduits may be enclosed.

### FUNCTION AND UTILITY

Use of this lightweight fireproofing plaster in multi-story buildings to replace the heavy masonry or concrete formerly used to protect the steel structure greatly reduces the dead load and enables the designing engineer to use substantially lighter, less costly steel members. This new concept in building design is not only lower in cost, but provides increased flexibility in design, beauty, utility and safety.

**Fire Ratings:** RED TOP FIRECODE Plaster provides fire-resistive ratings on all major types of steel floor units, and on steel beams and columns. (See FIRE TEST DATA for details.) Underwriters' Laboratories, Inc. have assigned a favorable Fire Hazard Classification, Guide No. 40 U 7.4½, which meets the requirements of NFPA pamphlet No. 220. UL labels on each bag verify that RED TOP FIRECODE Plaster, "Type D, or Type V Cementitious Mixtures," may be used in accordance with construction details shown in Guide No. 40, U18.3, to meet the published fire rating.

RED TOP FIRECODE Plaster provides shop primed steel with adequate protection from corrosion and eliminates the need for a job primer coat. (Test data available on request.)

**One-coat application** without hand tooling on steel floor units, and only two-coat application on beams and columns, as well as higher fire-retardant efficiency resulting in lower material usage, contribute to lower applied fireproofing costs than with other available materials.

**Texture:** Although not generally considered a finished surface, a pleasing spray texture can be accomplished. Acoustical Plaster may also be applied as a finish coat. Surface may also be spray painted with TEXOLITE Standard.

**RED TOP FIRECODE Plaster** is available in two types—

FIRECODE Plaster, in which Perlite is the aggregate.

FIRECODE "V" Plaster in which Vermiculite is the aggregate.

**Fire Ratings** are interchangeable on the two types.

### LIMITATIONS OF USE

1. RED TOP FIRECODE Plaster must be applied under conditions acceptable to plastering—protected from freezing.
2. RED TOP FIRECODE Plaster is designed for use on ceilings, beams, or columns not subject to contact, excessive high humidity, moisture, or vibration.

## TECHNICAL DATA—

### RED TOP FIRECODE PLASTER

Density (average) applied dry.....27#/cu. ft.
Insulation Value "k" factor.....80

### SOUND ABSORPTION

| Frequency | 125 | 250 | 500 | 1000 | 2000 | 4000 | NRC |
|---|---|---|---|---|---|---|---|
| Sound Absorption | .42 | .34 | .37 | .46 | .61 | .62 | .45 |

Sound absorption; from tests at a nationally recognized independent laboratory.

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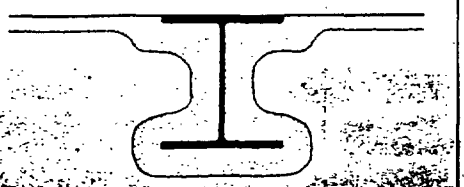
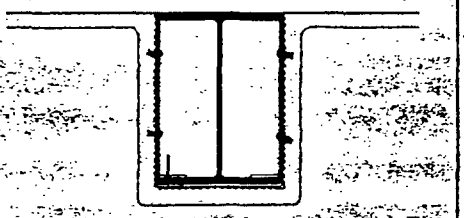
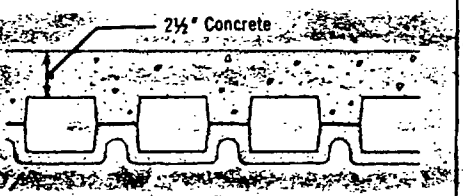
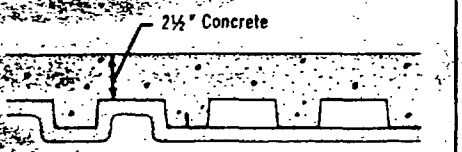
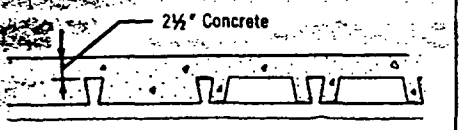
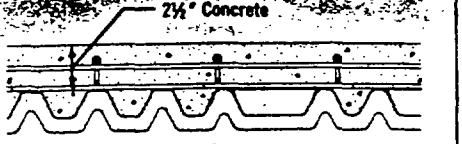
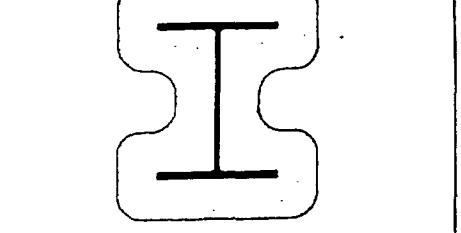
# RED TOP FIRECODE PLASTER[1]

| CONSTRUCTION | DESCRIPTION | RATING | THICKNESS | AUTHORITY |
|---|---|---|---|---|
|  | UL Design 32-3 Contour<br>UL Design C-112 Contour<br>UL Design 24-3 Contour | 3 hrs.<br>4 hrs.<br>4 hrs. | 1¼″<br>1¼″<br>1½″ | UL 4142-7<br>ULC CR-252<br>UL 4142-4 |
|  | UL Design 23-3 Boxed | 4 hrs. | 1″ | UL 4142-4 |
|  | UL Design 10-2 Contour<br>UL Design 22-3 Contour | 2 hrs.<br>3 hrs. | ½″<br>⅝″–¼″ | UL 4142-1<br>UL 4142-3 |
|  | UL Design 14-2 Contour<br>ULC Design C-112 Contour | 2 hrs.<br>3 hrs. | ¾″<br>¾″–1″ | UL 4142-2<br>ULC CR-252 |
|  | UL Design 32-3 Level | 3 hrs. | ¾″ | UL 4142-7 |
|  | UL Design 23-3 Contour | 3 hrs. | ⅝″ | UL 4142-4 |
|  | UL Design 13-3 Contour<br>UL Design 15-4 Contour | 3 hrs.<br>4 hrs. | 2⅛″<br>2½″ | UL 4142-5<br>UL 4142-6 |

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(1) Above test data is the result of tests completed as of 8-31-63. Consult your U.S.G. Representative for current data.

# SPECIFICATIONS

**I. SCOPE**—Unless otherwise shown on the drawings, all walls and ceilings shall be plastered as herein described.

**II. GENERAL PROVISIONS**—In cold weather, the temperature of the building shall be maintained in the uniform range above 55° for an adequate period prior to the application of plaster, while the plastering is being done, and after the plaster is dry. The heat shall be well distributed in all areas, with deflection or protective screens used to prevent concentrated or irregular heat on plaster areas near source. When required, heat shall be furnished by . . .

Proper protection should be provided during plastering for finished door and window frames and other designated areas which do not receive a plaster finish.

Ventilation shall be provided to properly dry the plaster during and subsequent to its application. In glazed buildings, this shall be accomplished by keeping windows open sufficiently to provide air circulation; in enclosed areas lacking normal ventilation, provisions must be made to mechanically remove moisture laden air.

If glazed sash are not in place and the building is subjected to hot, dry winds or temperature differentials from day to night of 20° F or more, openings shall be screened with cheesecloth or similar material.

**III. SURFACE PREPARATION**

a. Monolithic concrete to which BONDCRETE is to be applied shall be cleaned of all dust, loose particles and other foreign matter. Laitance and efflorescence shall be removed by washing with a 10% solution of commercial muriatic acid and water, and then cleaning with water to remove all traces of acid. Grease and oil shall be completely removed. Concrete surfaces shall have sufficient roughness to provide proper bond. If surfaces are not rough, they shall be hacked or bush-hammered, or dash coated with Portland cement grout composed of one part of cement and one and one-half parts of fine sand mixed to a mushy consistency. This coat shall be kept damp for at least two days immediately following its application and then allowed to dry. Before application of the plaster, the surface shall be evenly dampened if necessary to reduce suction.

b. Unit masonry surfaces that exhibit high suction may be moderately wetted immediately before plastering.

c. Where RED TOP AUDICOTE Acoustical Plaster is indicated for application direct to smooth monolithic concrete, reinforcing bar chair legs shall be either galvanized or coated with rust inhibitive paint and use of nails or other raw steel against forms or surface of concrete held to a minimum. Where metal is exposed in spite of these precautions, and where AUDICOTE is to be applied directly against corner beads or other metal accessories, the metal should be treated with one coat of aluminum paint.

**IV. GROUNDS**—Plaster thicknesses shall be as shown on plans; however, in no case shall the grounds be less than:

| | |
|---|---|
| Metal Lath and Wire Fabric | —⅝" (from face of lath). |
| Gypsum Lath | —½" |
| Long Length Gypsum Lath | —¾" |
| Masonry Units | —⅝" |
| Monolithic Concrete Ceilings | —⅛" (⅜" maximum) |
| Monolithic Concrete Walls | —⅛" (⅜" maximum) |
| TUFCON Base | —1/16" |
| Acoustical Plaster | —½" |

**V. MATERIALS**—Plaster and all cementitious material shall be stored under cover, up off the ground or floor, and kept dry until ready for use.

a. **Basecoat Plaster** shall be:
(RED TOP Wood Fiber), (RED TOP Cement Plaster), (STRUCTO-LITE), (BONDCRETE) as manufactured by the UNITED STATES GYPSUM COMPANY.

b. **Aggregate** shall be:
(Sand), (Perlite), (Vermiculite) meeting ASTM C-35 requirements. Sand for float finishes shall be a graded silica sand passing a (30 mesh) (20 mesh) screen.

c. **Water** shall be clean and fit to drink, free from oil, acid, alkali or vegetable materials.

d. **Finish Lime** shall be:
(IVORY), (GRAND PRIZE), (RED TOP) as manufactured by the UNITED STATES GYPSUM COMPANY.

e. **Gauging Plaster** shall be:
(STRUCTO-GAUGE), (Keenes Cement), (STAR), (CHAMPION), (RED TOP) as manufactured by the UNITED STATES GYPSUM COMPANY.

f. **Prepared Finish** shall be ORIENTAL Interior White Finish as manufactured by the UNITED STATES GYPSUM COMPANY.

g. **Acoustical Plaster** shall be:
(HI-LITE), (AUDICOTE) as manufactured by the UNITED STATES GYPSUM COMPANY.

i. **Plaster Ornaments and Mouldings** shall be made with RED TOP Moulding Plaster as manufactured by UNITED STATES GYPSUM COMPANY.

j. **Exterior Stucco Finish** shall be ORIENTAL Exterior Stucco as manufactured by the UNITED STATES GYPSUM COMPANY.

**VI. BASECOAT PROPORTIONS**

a. RED TOP Wood Fiber Plaster shall be mixed (neat) (up to 100:1 with sand) for scratch coat over (metal lath) (gypsum lath) and (neat) (100:1 with sand) for brown coat.
For application over masonry bases, use 1 cu. ft. of sand per 100 lbs. of plaster.

b. STRUCTO-BASE, or RED TOP Cement Plaster shall be mixed in the proportions shown in the chart on page 3.

c. STRUCTO-LITE shall be mixed with water only.

d. BONDCRETE shall be mixed with water only.

e. Portland Cement Mortar shall be mixed in the proportions as outlined on page 5.

**VII. GROUTING**—Grout shall consist of STRUCTO-LITE or RED TOP Cement Plaster sanded 100:2.

a. All steel door frames in solid plaster and steel stud partitions prior to lathing, and in masonry partitions as the masonry units are laid up.

b. All 2½ inch metal base shall be grouted.

**VIII. MIXING OF BASECOAT**—Basecoat plasters may be hand mixed or mechanically mixed to a uniform consistency following the manufacturer's directions.

**IX. BASECOAT APPLICATION**—Either hand or machine application methods may be used.
Three coats are required on metal lath, edge supported gypsum lath on ceilings, and on ⅜ and ½ inch Long Length gypsum lath.
Three-coat work is desirable on all gypsum lath.

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Two-coat work is acceptable on masonry plaster bases and all gypsum lath except as previously indicated.

a. **Two-coat work:** over gypsum lath and masonry, the base (first) coat shall be applied with sufficient material and pressure to form a good bond to the base and to cover well, and then be doubled back to bring the plaster out of grounds, straightened to a true surface with rod and darby without the use of additional water, and left rough to receive the finish (second) coat. (High suction masonry bases may require moderate wetting of surface before plastering.)

**Three-coat work:** the scratch (first) coat shall be applied with sufficient material and pressure to form good full keys on metal lath, and a good bond on other bases, and then be cross-raked. The brown (second) coat shall be applied after the scratch (first) coat has set firm and hard, brought out to grounds and straightened to a true surface with rod and darby without the use of additional water, and left rough to receive the finish (third) coat.

b. **Optional Inclusions:**

1. *Solid Long Length ROCKLATH Partition:* The scratch coat shall be applied ⅛-inch thick, with a maximum set of 3 hours, to each side of the lath, simultaneous, if possible, or within a 3 hour interval. Cross-rake lightly horizontally only. The brown coat shall be applied to the unbraced side after the scratch coats have set and partially dried, (not less than 16 hours). After brown coat has set firmly (not less than 3 hours) carefully remove the braces and brown coat the second side. Brown coat shall be brought out to a true plane and left rough.
2. *Solid Studless Metal Lath Partition:* The scratch coat shall be applied to the lath side and partially dry. The brown coat shall then be applied to the side opposite the braces, allowing it to set thoroughly before removing temporary braces. Next the brown coat shall be applied to braced side to bring the plaster out to grounds, straightened to a true surface with rod and darby without the use of additional water, and left rough to receive the finish coat.
3. *Solid Channel Stud Metal Lath Partition:* The scratch coat shall be applied to lath side and allowed to set and partially dry. The back-up coat shall then be applied to the channel side to full grounds, ½" over channels, in not less than two operations and allowed to set. The brown coat on lath side shall then be applied to bring the plaster out to grounds, straightened to a true surface with rod or darby without the use of additional water, and left rough to receive the finish coat.
4. *Resilient ROCKLATH Plaster Base Ceiling:* Use three-coat method only, allowing the scratch coat to set and partially dry before applying brown coat.
5. *BRACETITE System Ceiling:* The three-coat method is recommended. If the two-coat system is used, a minimum of 20 minutes must be allowed before doubling back and the setting time of the basecoat must not exceed 3 hours.
6. *Monolithic Concrete:* Surfaces of walls and columns shall have a scratch coat of BONDCRETE, followed immediately with a brown coat of RED TOP Cement Plaster and sand 100:2 troweled into the BONDCRETE while it is soft and unset. Brown coat shall be brought out to a true level surface without an application of water. Cross-rake the surface. Ceiling surfaces shall have a coat of BONDCRETE scratched in thoroughly, doubled back to a true level surface. Cross-rake the surface.
7. *Portland Cement Basecoats* shall be applied in two coats. Scratch coat shall be cross-raked and after setting damp cured for not less than 48 hours. Brown coat shall be damp cured after setting for not less than 48 hours.
8. *Where plaster is flush* with metal base, metal door frames, etc., a groove shall be made at the junction to reduce the possibility of chipping. Basecoat plaster shall be cut free from these metal sections before the plaster sets.

## X. PREPARATION OF LIME

a. **IVORY Lime** shall be mixed with approximately 5½ to 6 gallons of water for each 50 lb. bag. Machine mix or box soak for immediate use, or may soak overnite.
b. **GRAND PRIZE or RED TOP Lime** shall be box soaked or machine mixed using approximately 6 gallons of water per 50 lb. bag, and allowed to soak for 16 hours.

## XI. PROPORTIONS OF FINISH COATS

a. **Gypsum gauged lime putty finish** shall be mixed in the proportions of 100 lbs. of gauging plaster to 200 pounds of dry lime. Over lightweight aggregate basecoats, ½ cu. ft. of perlite fines or 50 pounds of No. 1 silica sand per 100 pounds of gauging plaster shall be added.
b. **Medium hard STRUCTO-GAUGE lime putty finish** shall be mixed in the proportion of 100 pounds of STRUCTO-GAUGE to 200 pounds of dry lime.
c. **Hard STRUCTO-GAUGE lime putty finish** shall be mixed in the proportion of 100 pounds of STRUCTO-GAUGE to 100 pounds of dry lime.
d. **Standard Hard Keene's cement lime putty finish** shall be mixed in the proportion of 100 pounds of Keene's cement to 100 pounds of dry lime.
e. **Medium Hard Keene's cement lime putty finish** shall be mixed in the proportion of 100 pounds of Keene's cement to 50 pounds of dry lime.
f. **Extra Hard Keene's cement lime putty finish** shall be mixed in the proportion of 100 pounds of Keene's cement to 25 pounds of dry lime.
g. **Keene's-lime-sand finish** shall be mixed in the proportion of 100 pounds of Keene's cement to 50 pounds of dry lime and 400 pounds of sand.
h. **ORIENTAL Interior White Finish** shall be mixed with clean water only to proper application consistency.
i. **ORIENTAL Exterior Stucco** shall be mixed with clean water only to proper application consistency.
j. **TUFCON Finish and Catalyst** shall be mixed in accordance with the manufacturer's directions.
k. **HI-LITE Acoustical Plaster** shall be machine mixed to the proper consistency and density according to the manufacturer's directions.
l. **AUDICOTE Acoustical Plaster** shall be mixed for hand application or machine application according to the manufacturer's directions.

## XII. APPLICATION OF FINISH COATS

a. **Trowel Finish coats** shall be scratched in thoroughly and immediately doubled back to fill out to a smooth, dense

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surface for decoration free of surface blemishes and irregularities. Thickness shall be no more than ⅛ inch. Keenes Cement Finishes shall be troweled until the material sets.

b. **Float Finish coats** shall be scratched in thoroughly and immediately doubled back to a true, even surface. Float using a (shingle), (cork), (wood), (carpet) or (rubber) float to bring aggregate to the surface to produce a finish of uniform texture free of slick spots, cat faces, and other blemishes. Use water sparingly in natural color, and no water shall be used on colored finishes.

c. **Machine Applied Spray Finishes** shall be uniformly applied to produce a texture approved by the architect.

d. **TUFCON Finish** shall be machine applied to a thickness of 1/16 inch, in accordance with the manufacturer's directions.

e. **Acoustical Plasters** shall be applied in not less than two coats, to full ½ inch grounds, following the manufacturer's directions.

f. **Ornamental Plastering:** Ornamental plaster shall be executed in accordance with the full-sized details shown on the drawings. Cornices and moldings shall be run full, straight and true with molding plaster, using clean cut metal templets conforming to the profiles shown on the drawings. Lines shall be in alignment, with true intersections, and accurate mitres at corners and angles. Enriched ornamental work which cannot be run in place shall be cast with casting plaster in gelatine molds. The work shall be solidly backed with jute or burlap, shall be properly reinforced with galvanized iron, and shall be securely stuck and wired in place with copper wires not lighter than 16 gauge. All joints shall be carefully made and neatly pointed so as to be invisible. All rough spots shall be eliminated with fine sandpaper, and the entire work left in proper condition, ready for decoration.

**XIII. FIREPROOFING PLASTER**—RED TOP FIRECODE Plaster as manufactured by the UNITED STATES GYPSUM COMPANY shall be machine applied to the underside of all steel floor sections, beams and columns as shown on plans or herein specified. Surfaces shall be clean, dry and free of grease or oil. FIRECODE Plaster shall be mixed and applied according to the manufacturer's directions to average thicknesses shown on plans but not less than:

Columns
Beams (caged)
Beams (direct)
Cellular Steel Floor

*Note:* Indicate the thicknesses required by selecting from data on page 9.

**XIV. PATCHING**—Point up around trim and other work. Cut out and patch defective and damaged plaster. Patching of plaster shall match existing work in texture and finish and joinings with plaster previously applied shall finish flush and smooth.

**XV. COMPLETION**—At the completion of the finish plaster work, all plaster shall be cleaned from beds, screeds, metal base and metal trim, leaving work ready for decoration by others. All plaster rubbish shall be removed from the building, leaving floors broom clean. Excess material, scaffolding, tools and other equipment shall be removed from the building and job site.

**"STRUCTO-LITE," "RED TOP," "BONDCRETE," "PYROBAR," "ROCKLATH," "ORIENTAL," "FIRECODE," "IVORY," "GRAND PRIZE," "MORTASEAL," "CHAMPION," "STAR," "BRACE-TITE," "TRUSSTEEL," "HI-LITE," "AUDICOTE," "TEXOLITE" and "USG" are registered trade-marks.**

**"STRUCTO-GAUGE" is a trade-mark owned by United States Gypsum and is used by it to distinguish products of its manufacture.**

**"STRUCTO-LITE" identifies the particular prepared plaster manufactured only by United States Gypsum.**

**"RED TOP" identifies the particular plasters and finishes manufactured only by United States Gypsum.**

**"BONDCRETE" identifies the particular plaster for concrete surfaces manufactured only by United States Gypsum.**

**"PYROBAR" identifies the particular gypsum partition tile manufactured only by United States Gypsum.**

**"ROCKLATH" identifies the particular gypsum lath or plaster base manufactured only by United States Gypsum.**

**"ORIENTAL" identifies the particular colored finishes manufactured only by United States Gypsum.**

**"FIRECODE" identifies the particular prepared plaster manufactured only by United States Gypsum.**

**"AUDICOTE" and "HI-LITE" identify the particular acoustical plasters manufactured only by the United States Gypsum Company.**

**"IVORY" and "GRAND PRIZE" identify the particular hydrated lime manufactured only by the United States Gypsum Company.**

**"MORTASEAL" identifies the particular masonry lime manufactured by United States Gypsum.**

**"CHAMPION" and "STAR" identify the particular white gauging plasters manufactured only by the United States Gypsum Company.**

**"STRUCTO-GAUGE" identifies the particular prepared gauging plaster manufactured only by United States Gypsum.**

**"TRUSSTEEL" identifies the particular truss designed stud manufactured only by the United States Gypsum Company.**

**"BRACE-TITE" identifies the particular attachment clips manufactured only by the United States Gypsum Company.**

**"TEXOLITE" identifies the particular paint manufactured only by United States Gypsum Company.**

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