LIGHTWEIGHT FIBER REINFORCED PERLITE CEMENT PLASTERS

Portland cement plasters made with perlite aggregate instead of sand offer many advantages. They are more fire resistant, better insulators and weigh approximately 60% less than conventional cement and sand plasters. With the addition of fiber reinforcement, superior crack resistance is achieved. In addition, fiber reinforced perlite cement plaster panels can be safely and easily handled in the field.

Fiber Reinforced Perlite Cement Plasters

The addition of alkali resistant glass, polypropylene or acrylic fibers makes possible the manufacture of prefabricated steel stud, lath and plaster exterior wall panels for high rise structures. Perlite cement plasters with fiberglass reinforcement can also be used for fire protecting structural steel columns or for any normal application where conventional cement plasters might be used.

Panelizing

Fiber reinforced perlite cement plaster panels using steel studs may be constructed in a fabricating shop and shipped to the job site for installation. On smaller projects, it has proven more efficient to prefabricate the wall panels on each floor of the building and tip them into place.

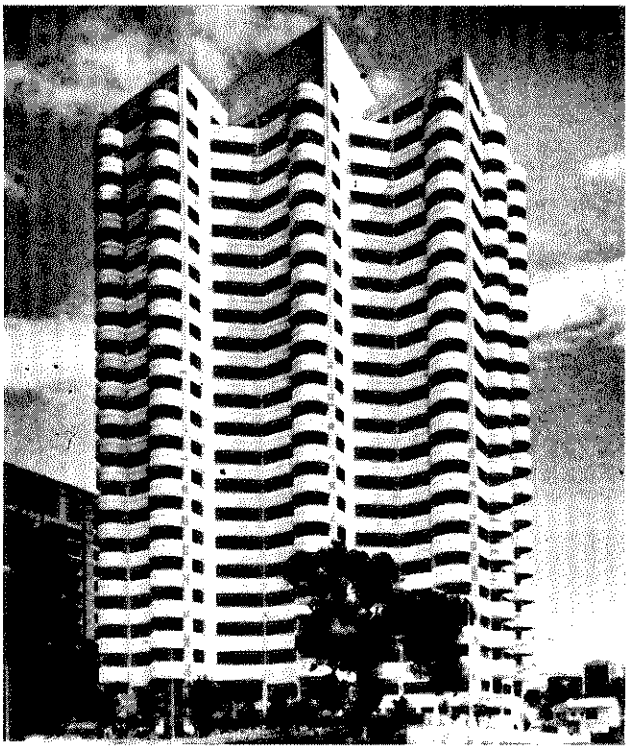
Typical Aggregate Characteristics*

Bulk Density 6-12 lb/ft^3 (100-200 kg/m^3)

Grading Requirements

Sieve Size	Volume Retained % (Cumulative)	
	Max.	Min.
Number 4 (4.75 mm)	0	-
Number 8 (2.36 mm)	5	0
Number 16 (1.18 mm)	60	5
Number 30 (0.60 mm)	95	45
Number 50 (0.30 mm)	98	75
Number 100 (0.15 mm)	100	85

*Conforms to ASTM C-35



Mixing

In batch mixing, all required water is placed in the mixer and cement is added and mixed for approximately 1 minute until the slurry is uniform. Perlite aggregate and chopped fiber is added as the mixer is rotated. Mixing should continue until the mix is thoroughly blended but should not exceed 4 minutes. The batch should not be overmixed.

Application

Fiber reinforced perlite cement plaster may be machine or hand applied. For machine application, 1/2 in. (13mm) long fibers are preferred as they do not tend to ball up in the equipment. On vertical applications, plastering should consist of separate scratch and brown coats. The brown coat may be applied as soon as the scratch coat has set sufficiently hard to support subsequent coats. For horizontal applications (panel construction), plaster may be poured in one coat and screeded level. When plaster begins to set it should be floated to provide compaction.

Fiber Reinforced Perlite Plaster Mix Proportions and Properties*

Mix Proportions	Dry Density		Average 28 Day Strength			
			Compressive		Flexural	
	lb/ft^3	kg/m^3	lb/in^2	kPa	lb/in^2	kPa
94 lb (43 kg) Portland Cement (Type I/II) 50 lb (23 kg) Lime (Type S) 6 ft^3 (0.17 m^3) Perlite Plaster Aggregate 4 lb (2 kg) Alkali Resistant Glass Fibers	47	750	1000+	6900+	172	1186
94 lb (43 kg) Portland Cement (Type I/II) 94 lb (43 kg) Plastic Cement 6 ft^3 (0.17 m^3) Perlite Plaster Aggregate 1.4 lb (0.6 kg) Polypropylene Fibers	46	740	1100+	7600+	164	1131
** 94 lb (43 kg) Portland Cement (Type I/II) 94 lb (43 kg) Plastic Cement 3 ft^3 (0.085 m^3) Perlite Plaster Aggregate 1.4 lb (0.6 kg) Polypropylene Fiber	66	1050	1800+	12,400+	265	1830
94 lb (43 kg) Portland Cement (Type I/II) 50 lb (23 kg) Lime (Type S) 8 ft^3 (0.23 m^3) Washed Plaster Sand	120	1920	1000+	6900+	167	1151

*American Standards Testing Laboratory, #7357, #3332, #3333

**High strength, high shear base for tile or veneer.

Brown coats should be flat and even but be sufficiently rough to receive finishes.

Finishing

To assure proper hydration of the cement, the basecoat plaster should be kept damp for at least 48 hours. After the basecoat has been allowed to dry at least 5 days, finish materials may be applied following manufacturers recommendations. Fiber reinforced perlite cement plaster basecoats accept a wide variety of finishes such as cementitious color and texture coats, stucco, polymerized cementitious coatings, tile or masonry veneer. Tests have shown that the basecoat exceeds required shear values for tile and veneer by 300-400%

Code Approvals

Perlite plaster aggregate is approved by code authorities in many areas as a substitute for sand in cement plaster. Fiber reinforced perlite cement plaster is also approved by many code authorities including ICBO.

Expanded perlite aggregate can be manufactured to weigh from 2 lb/ft^3 (32 kg/m^3) to 15 lb/ft^3 (240 kg/m^3) making it especially suitable for a number of applictions in the construction industry. In addition to cement plasters, perlite aggregate may be used in a variety of insulating plasters, lightweight insulating concretes, masonry wall insulations, cryogenic insulations, floating floor applications and in the manufacture of simulated stone and brick.

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